

**Application for Locally Adopted Energy Standards  
by the Sonoma County In Accordance With  
Section 10-106 of the California Code of Regulations,  
Title 24, Part 1**

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From:

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## **1.0 Executive Summary**

The Sonoma County Board of Supervisors approved its revised Green Building Ordinance at a first hearing on November 2, 2010. This revised ordinance is scheduled to take effect on or shortly after January 1, 2010. Gabel Associates has researched and reviewed the feasibility and energy cost-effectiveness of permit applicants exceeding the state's 2008 Building Energy Efficiency Standards in order to meet the minimum energy efficiency requirements of the proposed ordinance.

### **Overall Scope of the Ordinance**

<b>New ordinance or revision to previous ordinance?</b>	<b>Revised Ordinance</b>
<b>Projected Effective Date:</b>	<b>January 1, 2010</b>
<b>Green building or stand-alone energy ordinance?</b>	<b>Green Building Ordinance</b>
<b>Do minimum energy requirements increase after initial effective date?</b>	<b>No</b>
<b>Occupancies covered?</b>	<b>All New Residential and Nonresidential Buildings</b>
<b>Energy requirements apply to new construction, additions, alterations?</b>	<b>New Construction Only</b>
<b>Special or unusual energy requirements?</b>	<b>No</b>
<b>Third party verification?</b>	<b>No</b>
<b>Implementation details in the ordinance or in a separate document?</b>	<b>None</b>

### **Key Features of the Ordinance By Occupancy Type**

<b>Occupancy Type</b>	<b>General Requirements</b>	<b>Minimum Energy Requirement</b>
<b>New Low-rise Residential Buildings</b>	<b>2010 CALGreen Tier 1</b>	<b>15% Better-than-Title 24</b>
<b>New Nonresidential, High-rise Residential &amp; Hotel/Motel Buildings</b>	<b>2010 CALGreen Tier 1</b>	<b>15% Better-than-Title 24</b>

## **2.0 Text of the Sonoma County Ordinance**

*Note: Key sections are highlighted in yellow on pages 27, 37 and 41. Findings begin on page 41.*

### **Ordinance No.**

**An Ordinance of the Board of Supervisors, County of Sonoma, State of California, Amending Chapters 7 (Building Regulations), 7A (Limited Density Owner Built Rural Dwellings), 7D1 (Green Building), and 7D2 (Local Energy Efficiency Standards), of the Sonoma County Code, and Adopting by Reference with Local Amendments, Selected Provisions, Chapters and Appendices of the California Code Of Regulations, Title 24, 2010 Editions Of The California Building Standards Code, Including: (1) The California Building Code Volumes 1 and 2; (2) The California Residential Building Code; (3) The California Green Building Standards Code; (4) The California Mechanical Code; (5) The California Plumbing Code; (6) The California Electrical Code; (7) The California Energy Code, (8) The California Referenced Standards Code, and (9) The California Administrative Code; and Adopting Local Findings; and Making Other Technical and Administrative Revisions to Chapters 7, 7A, 7D1, and 7D2.**

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The Board of Supervisors of the County of Sonoma, ordains as follows:

**SECTION I.** Chapter 7 of the Sonoma County Code is hereby amended as follows:

**(a) Section 7-3, Local appeals board and housing appeals board is revised to read:**

Sec. 7-3. - Local appeals board and housing appeals board.

There is created the local appeals board and housing appeals board as provided in Section ~~108.8~~ 1.8.8.3 of the California Building Code, consisting of seven (7) members appointed by the board of supervisors. The housing appeals board may be made up of the same members as the local appeals board. The term of office of each shall be four (4) years or until his or her successor is appointed and qualified. Vacancies other than upon the conclusion of a term shall be filled for the remainder of the predecessor's term. Members shall be qualified by experience and training to rule upon matters pertaining to building code interpretation, fire code interpretation, and suitability of alternate materials and types of construction. It shall be the policy of the board of supervisors to appoint as members at least one (1) registered civil engineer, one (1) registered fire protection engineer, one (1) licensed architect, and one (1) contractor with at least a Class B license, but this policy shall in no way deprive the board of supervisors of its full discretion in the appointment of otherwise qualified persons. Each member shall receive twenty-five dollars (\$25.00) for each meeting attended but not to exceed fifty dollars (\$50.00) in any one (1) calendar month. The local appeals board and housing appeals board shall by resolution fix regular times and places for its meetings. Except where inconsistent with the provisions of this section, Section 7-4, Section 13-11 or Section 13-12 of this code, the duties of the local appeals board and housing appeals board shall be as prescribed in Section 108.8.3 of the California Building Code.

**(b) Section 7-4, Appeals, is revised to read:**

Sec. 7-4. - Appeals.

Appeal may be made from any decisions of the chief building official in accordance with Section ~~108.8.3~~ 1.8.8.3, Division I, Chapter 1, of the California Building Code and Section ~~412~~ 113.3 of Appendix Chapter 1, Division II, of the California Building Code provided, however, that such appeal may not be made more than thirty (30) days after the decision from which appeal is being made has been rendered. Prescriptive standards as set forth in this code do not constitute a decision of the Building Official appealable under this section. All applicants and appellants shall be given reasonable opportunity to be heard and present evidence. Decisions of the local appeals board and housing appeals board shall be in writing and shall be delivered to the appellant either in person or by mailing to the address stated on the appeal or application. Decisions of the local appeals board and housing appeals board are final. The local appeals board and housing appeals board shall have no authority relative to fees, permit processing or other matters which are not directly related to building standards, and shall have no authority to waive the requirements of this code. Appeals of any notice of violation or notice and order to abate any violation of this code shall be heard and decided by a hearing officer pursuant to Section 1-7.3 of the Sonoma County Code.

**(c) Section 7-5, Building permit required, is revised to read:**

Sec. 7-5. - Building permit required.

No person, firm or corporation shall erect, construct, enlarge, alter, repair, move, improve, convert or demolish any building or structure in the unincorporated area of this county, or cause the same to be done, without first obtaining a separate building permit for each such building or structure as required by this chapter. Permits shall be issued and fees shall be collected by the permit and resource management department. The building standards for the work authorized by the new permit shall be governed by the codes in force at the time of the new permit application as described in Chapter 1, Division I, Section 1.8.2, of the California Building Code as to the erection and construction of dwellings and appurtenant structures for which construction was lawfully commenced, commenced to legalize a violation, or approved prior to the effective date of this ordinance.

(b) Permits shall not be issued by the permit and resource management department for work which includes any of the following, unless and until written approval has been received:

(1) The construction, alteration or modification of:

(i) Any on-site disposal system (approval required from the well and septic section of permit and resource management department),

(ii) Any water supply system which under state law or county ordinance is required to have a permit to operate (approval required from the health officer or the state health services department),

(iii) Any establishment selling or preparing food or food products, any public or semi-public swimming pool as defined in the ~~2007~~ 2010 California Administrative Code (approval required from the health officer);

(2) The construction, alteration or modification of any structure which will result in the structure being connected to an on-site wastewater disposal system or water system; (approval required from the well and septic section of permit and resource management department),

(3) The alteration or modification of any existing structure which is connected to an on-site wastewater disposal system or water system requiring a permit, where the alteration or modification may impose additional burdens upon the existing system, such as, but not limited to, the addition of rooms or the modification of floor plans for potential additional occupancy. This section shall not apply to repairs, such as replacement of roofing or siding. Where the permit is for modification or alteration of an existing structure, no permit will be issued where, in the determination of the chief building official, such modification is likely to result in exceeding the capacity of the system;

(4) The construction, alteration or modification of any structure which may result in the property being improved in excess of its capacity to absorb sewage effluent. This section is intended to cover any change in the property which might adversely affect sewage disposal such as, but not limited to grading or the construction of a barn or swimming

pool which might infringe on the leach field (approval required from the well and septic section of permit and resource management department);

(5) For the purposes of this section, approval by the well and septic section of permit and resource management department shall mean either an office clearance, field clearance, or issued well and septic permit for on-site wastewater disposal system.

(c) Whenever approval of the on-site wastewater disposal system is required, it shall be based upon the requirements imposed by this chapter and any other state or local law or regulation which may be applicable, including basin plans and other standards promulgated by the North Coast Water Quality Control Board and the San Francisco Bay Regional Water Quality Control Board.

(d) Building permits must be cleared as to zoning considerations in Chapter 26 or 26C, grading and drainage requirements in Chapter 11, and stormwater requirements in Chapter 11A of this code. Building permits for projects regulated by the California Fire Code and Sonoma County fire safe standards may be subject to review and approval by appropriate fire service agencies. Where county road encroachment is necessary, a permit for same shall be first secured. A water and/or sewer clearance is first required in areas serviced by special districts and cities before building permits can be issued.

(e) Notwithstanding any other provision of this chapter or the codes adopted hereby, emergency maintenance work or repair of buildings and structures requiring a permit hereunder may be commenced before obtaining a permit without violating this chapter provided the permit and resource management department or the public health officer, in the appropriate case, is notified prior to noon of the next following business day and the permit required is obtained within twenty-four (24) hours thereafter, and provided further that no work shall be covered before it has been duly inspected and approved. Compliance with the State Subdivision Map Act, the Sonoma County subdivision regulations, and the Sonoma County zoning regulations, including compliance with conditional permits issued thereunder, and compliance with all laws, is a condition precedent to the issuance of any permit required by this chapter for work to be done on any particular parcel of real property in the unincorporated area of this county.

(f) As a condition precedent to the issuance of a building permit required by this section for which an application was made on or after November, 1989, the applicant shall pay to the county ~~a countywide traffic mitigation development fee as specified in Section 26-98-660 of this code. for the purpose of offsetting the road infrastructure costs caused by the cumulative effect of development in the county. The amount of the fee shall be adopted by the board of supervisors in accordance with the procedures set forth in Government Code Section 65962.~~ The permit required for Section 105 of Appendix 1 of the California Building Code for structures subject to the requirements of this subsection shall not be issued unless and until the ~~traffic mitigation~~ development fee has been paid.

(g) Within flood-prone urban areas as defined in Section 7-13(a)(10), a building permit authorizing excavation for foundations shall not be issued until a disposal location for excavated material has been designated. Acquisition of a building permit does not relieve the permittee of the responsibility for acquiring any other state and local permits required for the activity.

(h) In any unincorporated portion of Sonoma County where stormwater discharges are subject to the requirements of one or more NPDES permits, as referenced in Chapter 11, any construction site for which building permits are approved pursuant to Chapter 7 must be developed and used pursuant to any applicable requirements of said NPDES permit(s). Failure to adhere to applicable NPDES permit requirements at any time will be deemed to be a violation of this section and may subject the permittee to the penalties established by this chapter. Permittees may meet this requirement by filing with the Regional Water Quality Control Board the appropriate notice of intent to comply with the state general construction activity stormwater permit or by obtaining approval of an individual NPDES permit from the Regional Water Quality Control Board.

**(d) Section 7-9, Refunds, is revised to read:**

Sec. 7-9. - Refunds.

Pursuant to Section ~~108.6~~ 109.6 of Chapter 1, Division II, ~~Appendix~~ of the California Building Code, 103.4.5 of ~~Appendix~~ Chapter 1 of the California Plumbing Code, Section 115.6 of ~~Appendix~~ Chapter 1 of the

California Mechanical Code, and Section ~~80.19 E of Annex G~~ 89.108.4.2 of the California Electrical Code, refunds of fees paid may be made, subject to the following:

- (a) One hundred percent (100%) of a fee erroneously paid or collected may be refunded.
- (b) Ninety percent (90%) of the plan review fee may be refunded when an application for a permit for which a plan review fee has been paid is withdrawn or cancelled or expires or becomes void before any plan review effort has been expended. No portion of the plan review fee shall be refunded when any plan review effort has been expended.
- (c) Ninety percent (90%) of the building, plumbing, electrical, and/or mechanical permit fee may be refunded when a permit for which some or all of these permit fees have been paid is withdrawn or cancelled or expires or becomes void before any work was done and before any inspections are performed. No portion of these fees shall be refunded when any work was done and/or any inspections have been performed.
- (d) The chief building official may authorize the refund of all or part of a fee in order to correct an error by the department. The details of such a refund shall be retained in project file.
- (e) Application for refund must be made within one (1) year of the date the fee is paid.

**(e) Section 7-13, Codes adopted and modifications, is revised to read:**

Sec. 7-13. – Codes adopted and modifications.

(A) ~~(a)~~ 20107 California Building Code Volumes 1 and 2, Chapters 1-35, including Part 7, “California Elevator Safety Construction Code”, Part 8, “California Historical Building Code”, Part 9, “California Existing Building Code”, Appendix Chapter 4, A1, Appendix C, Appendix H, and Appendix I; 2007 California Historical Building Code Chapters 8-1 through 8-10; and the 2007 California Existing Building Code, Appendix Chapter A-1, are hereby adopted and incorporated herein by reference, save and except such portions as are deleted, modified or revised as follows:

~~(1) The chief building official may, in his or her discretion, waive the plan check fee for the second and all subsequent buildings or structures identical to a building or structure for which a plan check has been paid. This plan check fee waiver for subsequent submittals shall be limited to one (1) year following date of original fee payment. In each case the applicant must be the same for all permits.~~

~~(2) Demolition permits will be required.~~

(1) Section 101.4.4 of Chapter 1, Division II, of the California Building Code is amended to read:

101.4.4. The provisions of Sections 116 of the California Building Code as amended by Sonoma County Code by adding Sections 116.1.1 and 116.1.2, shall apply to existing buildings and premises

(2) Intentionally left blank

(3) Section 105.2 of ~~Appendix Chapter 1~~ of Chapter 1, Division II, of the California Building Code is amended to read:

105.2 Work exempt from permit. Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of the jurisdiction. Such exempt structures must meet all other applicable requirements of this jurisdiction, including required minimum distances from property lines. Permits shall not be required for the following:

(a) Building Permit Exemptions:

1. One-story detached accessory buildings used as tool and storage sheds, playhouses and similar uses, when located on a parcel which contains an existing Group R, and/or Group U Occupancy, provided the floor area does not exceed

120 square feet, and the height above grade does not exceed 12 feet. No more than one structure may be allowed under this exemption unless separated from another permit exempt structure by more than 50 feet.

2. Fences, not over 10 feet high, except that solid wood, concrete, metal, and masonry fences more than 6 feet in height measured from the lowest existing grade to the top of the fence shall require a building permit.

3. Oil derricks.

4. Retaining walls, which retain not more than 3 feet of material unless supporting a surcharge or impounding Class I, II, or IIIA liquids. For the purpose of this section, a retaining wall is considered to be supporting a surcharge if:

a. The wall retains more than one foot of material and the retained material slopes more than two units horizontal to one vertical within a distance equal to twice the height of the wall above the lowest existing grade, or

b. The wall retains more than one foot of material and any road or structure is located on the retained material within a distance equal to twice the height of the wall above the lowest existing grade.

5. Tanks, not containing Class I, II, or IIIA liquids supported directly upon grade, or below grade, if the capacity does not exceed 5,000 gallons and the ratio of height to diameter or width does not exceed 2 to 1.

6. Sidewalks, platforms, ~~and~~ driveways, non-structural slabs and decks not more than 30 inches above grade, and not over any basement or story below and are not part of an accessible route.

7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.

8. Temporary motion picture, television and theater stage sets and scenery.

9. Prefabricated swimming pools accessory to a Group R, Division 3 Occupancy which do not exceed 5,000 gallons, and are installed entirely above ground.

10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems. (Plumbing, electrical or mechanical systems associated with the structure require permits.)

11. Swings, play structures, and other playground equipment, treehouses with a floor area less than 120 square feet, and skateboard ramps, accessory to detached one and two family dwellings, which are not used for commercial purposes, and children's play structures when constructed on a parcel which contains a one or two- family dwelling or a State licensed school or day care center.

12. Window awnings supported by an exterior wall that do not project more than 54 inches from the exterior wall and do not require additional support of Group R-3 and U Occupancies.

13. Non-fixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches in height for office work spaces and cubicles.

14. Minor repair of interior paneling or gypsum wallboard when it does not serve as a fire-resistive assembly or as lateral bracing for a structure. Minor repairs are limited to ~~500~~ 100 square feet, on a one time basis. Subsequent minor repairs will require permits. This exemption shall not apply to structures subject to flood damage.

15. Replacement of windows or doors with others of the same size, and in the same location when the structural frame of the opening is not altered.

16. Prefabricated structures no more than 500 square feet in area, constructed of light frame materials and covered with cloth or flexible plastic, accessory to a single family dwelling, with no associated electrical, plumbing, or mechanical equipment and the height above grade does not exceed 12 feet.

17. Arbors, trellises, and gazebos, when the height above grade does not exceed 12 feet. For the purpose of this section, arbors, trellises, and gazebos are considered for detached shade structures accessory to residential occupancies and are defined as follows:



- a. Structures which have a lattice or fabric roof structure, and
- b. 75% of the exterior walls are not less than 75% open, and
- c. Into which a motor vehicle cannot be driven due to the configuration of the structure or placement on the site.

If such a structure contains electrical, plumbing, or mechanical equipment, a permit is required for this work.

18. Removal of up to 25% of exterior and/or interior or roof coverings or other similar work for the purpose of determining the condition of structural members in a structure where work is being planned. Such work may remain exposed for a maximum of 90 days before being repaired. A permit must be obtained for the repairs unless exempted by this section of the Sonoma county code.

19. 2-bin trash enclosure covers with a height not exceeding 12 feet.

(b) Electrical Permit Exemptions:

- 1. Minor repair work, including the replacement of lamps or the connection of approved portable electric equipment to approved permanently installed receptacles.
- 2. The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.
- 3. The installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.
- 4. Listed cord and plug connected temporary decorative lighting.
- 5. Reinstallation or replacement of attachment plug receptacles, but not the outlets therefor.
- 6. Repair or replacement of branch circuit overcurrent devices of the required capacity in the same location.
- 7. Installation or maintenance of communications wiring, devices, appliances, apparatus, or equipment.

(c) Gas Permit Exemptions:

- 1. Portable heating appliance.
- 2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

(d) Mechanical Permit Exemptions:

- 1. Portable heating appliance.
- 2. Portable ventilation equipment.
- 3. Portable cooling unit.
- 4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.
- 5. Replacement of any part that does not alter its approval or make it unsafe.
- 6. Portable evaporative cooler.
- 7. Self-contained refrigeration system containing 10 pounds (5 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.

(e) Plumbing Permit Exemptions:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with the new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.

2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

(4) Section ~~408.8.3~~ 1.8.8.3.1 of the California Building Code is added to Chapter 1, Division 1, of the California Building Code, to read:

Section ~~408.8.3.1~~ 1.8.8.3.1 Appeals. Appeals to orders, decisions or determinations of the Building Official relative to the requirements of this code shall be made in accordance with Sections 7-3 and 7-4 of the Sonoma County Code.

(5) Section 105.5 of ~~Appendix~~ Chapter 1, Division II, of the California Building Code is amended to read:

Section 105.5 Expiration. Unless otherwise authorized, every permit issued by the Permit and Resource

Management Department under the provisions of this code shall expire by limitation three (3) years from the date of permit issuance. The chief building official may limit a permit to a lesser time period when necessary to abate dangerous or substandard conditions. The chief building official may extend this time period when such extension is warranted, including (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the three year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

Before any work can be recommenced on any expired permit, or permit to legalize a violation, a new permit shall first be obtained. The new permit shall be obtained for all work necessary to finish the project including work already completed that has not been previously inspected and approved by the department. The building standards for the work authorized by the new permit shall be governed by the codes in force at the time of the new permit application as described in Chapter 1, Division 1, Section 1.8.3.1 of the California Building Code ~~Section 408.3.1~~ as to the erection and construction of dwellings and appurtenant structures for which construction was lawfully commenced, commenced to legalize a violation, or approved prior to the effective date of this ordinance. The fees for the new permit shall be based on the current fee schedule at full value of the previously permitted work minus the value of the work inspected and approved prior to expiration of the permit plus the full value of any new work not previously permitted per the Permit and Resource Management Department Expired Permit Policy.

(6) Section ~~408.2~~ 109.2 of ~~Appendix~~ Chapter 1, Division II, of the California Building Code is amended to read:

~~408.2~~ 109.2 Schedule of permit fees. On buildings, structures, electrical, gas, mechanical, and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

Where plans are incomplete or changed so as to require additional plan review, an additional plan review fee shall be charged at the rate shown in the Permit and Resource Management Department fee schedule.

When approved by the chief building official a reduction in plan review fees by twenty five percent (25%) ~~to seventy five percent (75%)~~ of that otherwise required may be granted where a peer review or third party plan review or other process results in substantially reduced plan review effort by the Permit and Resource Management Department.

The chief building official may, in his or her discretion, waive the plan check fee for the second and all subsequent buildings or structures identical to a building or structure for which a plan check has been paid. This plan check fee waiver for subsequent submittals shall be limited to one (1) year following date of original fee payment. In each case the applicant must be the same for all permits.

(7) Section 105.3.2 of ~~Appendix~~ Chapter 1, Division II, "Time limitation of application", of the California Building Code is amended to read:

105.3.2 Expiration of plan review. If no permit is issued within one year following the date of application, the application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the building official. If, after such expiration, the original plans are resubmitted within 180 days following such expiration, the plan review fee shall be 25% of that otherwise required. No application shall be renewed in this fashion more than once. In order to further renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. The chief building official may extend this time period when such extension is warranted, including but not limited to (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the allowed ~~three~~ year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

(8) Section ~~105.3.3~~ 109.7 is added to ~~Appendix~~ Chapter 1, Division II, of the California Building Code, to read:

~~105.3.3~~ 109.7 Reinspection Fees.

A reinspection fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made. This section is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for such inspection or reinspection. Reinspection fees may be assessed when the inspection record card not posted or otherwise available on the work site, the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from plans requiring the approval of the building official. The reinspection fee shall be established in the jurisdiction fee schedule. When a reinspection fee has been assessed, no additional inspection of the work shall be performed until the required fees have been paid

(9) Section ~~111.1.1~~ 112.4 is added to ~~Appendix~~ Chapter 1, Division II, of the California Building Code, to read:

~~111.1.1~~ 112.4 Connection after order to disconnect. Persons shall not make connections from any energy, fuel or power supply nor supply energy or fuel to building service equipment which has been disconnected or ordered to be disconnected by the building official or the use of which has been ordered to be discontinued by the building official until the building official authorizes the reconnection and use of such equipment.

(10) Section ~~112 of Appendix~~ 113 Chapter 1, Division II, of the California Building Code, Board of Appeals, is deleted.

(11) Section ~~113.4~~ 114.4 of ~~Appendix~~ Chapter 1, Division II, of the California Building Code is amended to read:

~~113.4~~ 114.4 Violation penalties. Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official, or of ~~the~~ a permit or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law. An investigation fee equal to the amount of the permit fee, whether or not a permit is then or subsequently issued. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this code nor from any penalty prescribed by law.

(12) Sections ~~115.1.1~~ 116.1.1 and ~~115.1.2~~ 116.1.2 are added to ~~Appendix~~ Chapter 1, Division II, of the California Building Code, to read:

~~115.1.1~~ 116.1.1 Definition of unsafe or dangerous building. Any building or structure which has any or all of the conditions or defects hereinafter described shall be deemed to be an unsafe or dangerous building, provided that such conditions or defects exist to the extent that the life, health, property or safety of the public or its occupants are endangered.

1. Whenever any door, aisle, passageway, stairway or other means of exist is not of sufficient width or size or is not arranged as to provide safe and adequate means of exit in case of fire or panic.

2. Whenever the walking surface of any aisle, passageway, stairway or other means of exit is so warped, worn, loose, torn or otherwise unsafe as to not provide safe and adequate means of exit in case of fire or panic.

3. Whenever the stress in any materials, member or portion thereof, due to all dead and live loads, is more than one and one half times the working stress or stresses allowed in the Building Code for new buildings of similar structure, purpose or location.
4. Whenever any portion thereof has been damaged by fire, earthquake, wind, flood or by any other cause, to such an extent that the structural strength or stability thereof is materially less than it was before such catastrophe and is less than the minimum requirements of the Building Code for new buildings of similar structure, purpose or location.
5. Whenever any portion or member or appurtenance thereof is likely to fail, or to become detached or dislodged, or to collapse and thereby injure persons or damage property.
6. Whenever any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof is not of sufficient strength or stability, or is not so anchored, attached or fastened in place so as to be capable of resisting a wind pressure of one half of that specified in the Building Code for new buildings of similar structure, purpose or location without exceeding the working stresses permitted in the Building Code for such buildings.
7. Whenever any portion thereof has cracked, warped, buckled or settled to such an extent that walls or other structural portions have materially less resistance to winds or earthquakes than is required in the case of similar new construction.
8. Whenever the building or structure, or any portion thereof, because of (i) dilapidation, deterioration or decay; (ii) faulty construction; (iii) the removal, movement or instability of any portion of the ground necessary for the purpose of supporting such building; (iv) the deterioration, decay or inadequacy of its foundation; or (v) any other cause, is likely to partially or completely collapse.
9. Whenever, for any reason, the building or structure, or any portion thereof, is manifestly unsafe for the purpose for which it is being used.
10. Whenever the exterior walls or other vertical structural members list, lean or buckle to such an extent that a plumb line passing through the center of gravity does not fall inside the middle one third of the base.
11. Whenever the building or structure, exclusive of the foundation, shows 33 percent or more damage or deterioration of its supporting member or members, or 50 percent damage or deterioration of its non-supporting members, enclosing or outside wall or coverings.
12. Whenever the building or structure has been so damaged by fire, wind, earthquake or flood, or has become so dilapidated or deteriorated as to become (i) an attractive nuisance to children; (ii) a harbor for vagrants, criminals or immoral persons; or as to (iii) enable persons to resort thereto for the purpose of committing unlawful or immoral acts.
13. Whenever any building or structure has been constructed, exists or is maintained in violation of any specific requirement including construction without permit or prohibition applicable to such building or structure provided by the building regulations of this jurisdiction, as specified in this Code or Health and Safety Code section 17920.3 or Uniform Housing Code Chapters 4, 5, 6 and Sections 701.2, 701.3, or of any law or ordinance of this state or jurisdiction relating to the condition, location or structure of buildings.
14. Whenever any building or structure which, whether or not erected in accordance with all applicable laws and ordinances, has in any non-supporting part, member or portion less than 50 percent, or in any supporting part, member or portion less than 66 percent of the (i) strength, (ii) fire-resisting qualities or characteristics, or (iii) weather-resisting qualities or characteristics required by law in the case of a newly constructed building of like area, height and occupancy in the same location.
15. Whenever a building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, air or sanitation facilities, or otherwise, is determined by the health officer to be unsanitary, unfit for human habitation or is such a condition that is likely to cause sickness or disease.

16. Whenever any building or structure, because of obsolescence, dilapidated condition, deterioration, damage, inadequate exits, lack of sufficient fire-resistive construction, faulty electric wiring, gas connections or heating apparatus, or other cause, is determined by the fire marshal to be a fire hazard.

17. Whenever any building or structure is in such a condition as to constitute a public nuisance known to the common law or equity jurisprudence.

18. Whenever any portion of a building or structure remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned for a period in excess of six months so as to constitute such building or portion thereof an attractive nuisance or hazard to the public.

19. Whenever any building or structure has been abandoned and unsecured for a period in excess of six months so as to ~~constituted~~ constitute an attractive nuisance or hazard to the public.

~~(12.1) 115.1.2~~ 116.1.2 Definition of nuisance. The following shall be defined as a nuisance:

~~1. a.~~ Any public nuisance known at common law or in equity jurisprudence.

~~2. b.~~ Any attractive nuisance that may prove detrimental to children whether in a building, on the premises of a building or on an unoccupied lot. This includes, but is not limited to, any abandoned wells, shafts, basements or excavations; abandoned refrigerators and motor vehicles; any structurally unsound fences or structures; or any lumber, trash, fences, debris, or vegetation that may prove a hazard for inquisitive minors.

~~3. c.~~ Whatever is dangerous to human life or is detrimental to health, as determined by the health officer.

~~4. d.~~ Overcrowding a room with occupants.

~~5. e.~~ Insufficient ventilation or illumination.

~~6. f.~~ Inadequate or unsanitary sewage or plumbing facilities.

~~7. g.~~ Uncleanliness, as determined by the health officer.

~~8. h.~~ Whatever renders air, food or drink unwholesome or detrimental to the health of human beings, as determined by the health officer.

(13) Section ~~115.3~~ 116.3 of ~~Appendix~~ Chapter 1, Division II, of the California Building Code is amended to read:

~~115.3~~ 116.3 Notice. If an unsafe condition is found, the building official shall serve on the owner, agent or person in control of the structure, a written notice that describes the condition deemed unsafe per Section 1-7.3 of the Sonoma County Code.

(14) Section ~~116~~ 117 is added to ~~Appendix~~ Chapter 1, Division II, of the California Building Code, to read:

SECTION ~~116~~ 117  
NOTICE TO VACATE

~~116.1~~ 117.1 Posting. Every notice to vacate shall, in addition to being served as provided in Section ~~115.4~~ 116.4, be posted at or upon each exit of the building and shall be in substantially the following form:

DO NOT ENTER  
UNSAFE TO OCCUPY

It is a misdemeanor to occupy this building, or to remove or deface this notice.

Building Official  
.....of.....

~~116.2~~ 117.2 Posting during declared emergencies. During a declared local emergency or State of emergency as defined in Chapter 10 of this Code, each structure or property affected by the declaration and subsequently reviewed shall be evaluated and posted in accordance with the standards established in Applied Technology Council (ATC) 20, ATC 45 or the most recently adopted standard by the California Office of Emergency Services as an emergency response plan.

~~116.3~~ 117.3 Compliance. Whenever such notice is posted, the building official shall include a notification thereof in the notice and order issued under Section 115.3 reciting the emergency and specifying the conditions which necessitate the posting. No person shall remain in or enter any building which has been so posted unless specifically stated on the posting. Entry may be made to repair, demolish or remove such building under permit. No person shall remove or deface any such notice after it is posted until the required repairs, demolition or removal have been completed and a certificate of occupancy issued pursuant to the provisions of the Building Code.

~~116.4~~ 117.4 Appeals. Appeals of any notice and order to abate any violation of this Code shall be heard and decided by a hearing officer pursuant to Section 1-7.3 of the Sonoma County Code.

(15) Section 202 of the California Building Code is amended to revise the definition of "building" to read:

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy. Building is also any structure as to which state agencies have regulatory power, and housing or enclosure of persons, animals, chattels, equipment or property of any kind. Building is also any structure wherein things may be grown, made, produced, kept, handled, stored or disposed of, and all appendages, accessories, apparatus, appliances and equipment installed as a part thereof. Building shall not include machinery, equipment or appliances installed for manufacture or process purposes only, nor shall it include any construction installations which are not a part of a building, any tunnel, mine shaft, highway or bridge, or include any house trailer or vehicle which conforms to the Vehicle Code.

~~NOTE: Building shall have the same meaning as defined in Health and Safety Code section 17920 and 18908 for the applications specified in Section 101.17.9 and 101.17.10.~~

(16) Section 202 of the California Building Code is amended to revise the definition of "building, existing" to read:

BUILDING, EXISTING. A building legally erected prior to the adoption of this code, or one for which a legal building permit was issued for the construction or legalization thereof prior to the adoption of this code.

(16.5) Section (17) through Section (31) Sonoma County Code is deleted. A new Section (17) through Section (47) is added as follows:

(17) Section 903.2 of the California Building Code is amended to read:

~~Section 903.2 Where required. Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12. An approved automatic sprinkler system shall be provided in new buildings and structures, and when additions are made to buildings or structures, as described in Sections 903.2.1 through 903.2.18~~

(18) Section 903.2.1 of the California Building Code is amended to read:

903.2.1 Group A.

An automatic sprinkler system shall be provided throughout new buildings and portions thereof used as Group A occupancies.

903.2.1.1 Group A-1

An automatic fire sprinkler system shall be provided for throughout Group A-1 occupancies. where one of the following conditions exists:

An automatic fire sprinkler system shall be provided throughout Group A-1 occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area exceeds 12,000 square feet.

2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.
4. The fire area contains a multi-theater complex.
5. The fire area is increased beyond the areas specified in Table 903.2

#### 903.2.1.2 Group A-2

An automatic fire sprinkler system shall be provided ~~for~~ throughout Group A-2 occupancies ~~where one of the following conditions exists:~~

An automatic fire sprinkler system shall be provided throughout Group A-2 occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area exceeds 5,000 square feet.
2. The fire area has an occupant load of 100 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.
4. ~~The structure exceeds 5000 square feet, contains more than one fire area containing a Group A-2 occupancy, and is separated into two or more buildings by fire walls of less than four hour fire resistance rating without openings.~~
4. The fire area is increased beyond the areas specified in Table 903.2

#### 903.2.1.3 Group A-3

An automatic fire sprinkler system shall be provided ~~for~~ throughout Group A-3 occupancies ~~where one of the following conditions exists:~~

An automatic fire sprinkler system shall be provided throughout Group A-3 occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area exceeds 12,000 square feet.
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.
4. ~~The structure exceeds 12,000 square feet, contains more than one fire area containing exhibition and display rooms, and is separated into two or more buildings by fire walls of less than four hour fire resistance rating without openings.~~
4. The fire area is increased beyond the areas specified in Table 903.2

#### 903.2.1.4 Group A-4

An automatic fire sprinkler system shall be provided ~~for~~ throughout Group A-4 occupancies ~~where one of the following conditions exists:~~

An automatic fire sprinkler system shall be provided throughout Group A-4 occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area exceeds 12,000 square feet.
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.
4. The fire area is increased beyond the areas specified in Table 903.2

#### 903.2.1.5 Group A-5

An automatic fire sprinkler system shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes and other accessory use areas in excess of 1,000 square feet.

(19) Section 903.2.2 of the California Building Code is deleted

(20) New Section 903.2.2 of the California Building Code is added to read:

#### 903.2.2 Group B

An automatic fire sprinkler system shall be provided throughout new buildings and portions thereof used as Group B occupancies. An automatic fire sprinkler system shall be provided throughout Group B occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area exceeds 12,000 square feet.
2. The fire area has an occupant load of 300 or more.
3. The fire area is increased beyond the areas specified in Table 903.2

#### 903.2.2.1 Remodel or addition - Group B ambulatory health care

An automatic sprinkler system shall be provided when a Group B ambulatory health care occupancy is created and any of the following conditions result.

1. Four or more care recipients are incapable of self-preservation.
2. One or more care recipients who are incapable of self-preservation are located at other than the level of exit discharge serving such occupancy.

(21) Section 903.2.3 of the California Building Code is deleted

(22) New Section 903.2.3 of the California Building Code is added to read:

#### 903.2.3 Group E

An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group E occupancies an automatic fire sprinkler system shall be provided throughout Group E occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area exceeds 12,000 square feet.
2. The fire area has an occupant load of 300 or more.
3. The fire area is increased beyond the areas specified in Table 903.2

#### 903.2.3.1 Public Schools –Automatic Sprinkler Requirements

##### 903.2.3.1.1 New Public School Campus.

An approved automatic sprinkler system shall be provided in all buildings of a new public school campus as defined in Section 202 regardless of occupancy classification.

Exceptions:

1. Exempted portable buildings.
2. Ticket booths and athletic field storage buildings that are less than 500 square feet in floor area and located a minimum of 100 feet from all other buildings.
3. Shade or lunch shelters that are incapable of trapping heat, smoke or other by-products of combustion and located a minimum of 20 feet from all other buildings.
4. Shade or lunch shelters that are constructed of non-combustible materials and located a minimum of 20 feet from all other buildings.

903.2.3.1.1.1 Sprinklers shall be installed in spaces where the ceiling creates a “ceiling-plenum” or space above the ceiling is utilized for environmental air.

(23) Section 903.2.4 of the California Building Code is deleted

(24) New Section 903.2.4 of the California Building Code is added to read:

#### 903.2.4 Group F

An automatic sprinkler system shall be provided throughout new buildings and portions thereof used as Group F occupancies

Exceptions:

1. Canopied winery crush pads less than 12,000 square feet in area, provided that all of the following conditions are met:
  - a. The canopy and supporting structure are constructed of non-combustible materials.
  - b. If attached, the crush pad is separated from other portions of the building by one-hour fire-resistive walls.



- c. The crush pad is not used for storage of combustible materials.
- d. The canopy and supporting structure is incapable of trapping heat, smoke or other byproducts of combustion.

2. Dairy milking facilities less than 12,000 feet in area.

903.2.4.1 Existing F-1 Woodworking operations

An automatic sprinkler system shall be provided throughout all Group F-1 occupancy fire areas that contain woodworking operations in excess of 2,500 square feet in area which generate finely divided combustible waste or which use finely divided combustible materials. A fire wall of less than four-hour fire resistance rating without openings, or any fire wall with opening shall not be used to establish separate fire areas.

903.2.4.2 Additions or remodels – F Occupancy

An automatic sprinkler system shall be provided throughout all buildings containing a Group F occupancy where any of the following conditions is created as a result of a remodel or addition:

- 1. The fire area is increased beyond the areas specified in Table 903.2
- 2. The fire area exceeds 12,000 square feet.
- 3. The fire area is located more than three stories, or more than 30 feet, above grade plane.
- 4. The combined area of all fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.
- 5. The fire area contains woodworking operations in excess of 2,500 square feet in area which generate finely divided combustible waste or which use finely divided combustible materials.

(25) Section 903.2.5.5 of the California Building Code is added to read:

903.2.5.2 Additions or remodels – H Occupancy

An automatic sprinkler system shall be provided throughout all buildings containing a Group H occupancy, and where an H Occupancy is created as a result of a remodel or addition.

(26) Section 903.2.6.3 of the California Fire Code is added to read:

903.2.6.3 Additions or remodels – I Occupancy

An automatic sprinkler system shall be provided throughout all buildings containing a Group I occupancy, and where an I Occupancy is created as a result of a remodel or addition.

(27) Section 903.2.7 of the California Building Code is deleted

(28) New Section 903.2.7 of the California Building Code is added to read:

903.2.7 Group M

An automatic sprinkler system shall be provided throughout new buildings and portions thereof used as Group M occupancies, and when an addition or remodel occurs affecting a Group M Occupancy as provided in this section. Exception: Detached non-combustible motor fuel-dispensing facility canopies classified as a Group M occupancy where the canopy and supporting structure is incapable of trapping heat, smoke or other byproducts of combustion.

903.2.7.1 High-piled storage.

An automatic sprinkler system shall be provided as required in Chapter 23 in all buildings where storage of merchandise is in high-piled or rack storage arrays.

903.2.7.2 Additions or remodels – M Occupancies

An automatic sprinkler system shall be provided for Group M occupancies where any of the following conditions is created as a result of a remodel or addition:

- 1. A Group M fire area exceeds 12,000 square feet.
- 2. A Group M fire area is located more than three stories above grade plane.
- 3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.
- 4. A Group M occupancy is used for the display and sale of upholstered furniture.

5. The structure exceeds 24,000 square feet in area, contains more than one fire area containing a Group M occupancy, and is separated into two or more buildings by fire walls of less than 4-hour fire-resistance rating.
6. The fire area is increased beyond the areas specified in Table 903.2

(29) Section 903.2.8. of the California Building Code is amended to add Section 903.2.8.1 to read:

903.2.8.1 Additions or remodels – R Occupancies.

An automatic sprinkler system shall be provided for Group R occupancies where any of the following conditions is created as a result of a remodel or addition:

1. The fire area is increased beyond the areas specified in Table 903.2
2. The fire area exceeds 12,000 square feet.

Exception: Attached carports of non-combustible construction classified as a Group-U Occupancy where there is no habitable space above, and which are accessory uses to a one- or two-family residential dwelling.

(30) Section 903.2.9 of the California Building Code is deleted

(31) New Section 903.2.9 of the California Building Code is added to read:

903.2.9 Group S

An automatic fire sprinkler system shall be provided throughout new buildings and portions thereof used as Group S occupancies, and when an addition or remodel occurs affecting a Group S Occupancy as provided in this section.

903.2.9.1 Repair garages

An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406 of the California Building Code.

903.2.9.2 Bulk storage of tires

Building, structures used for the storage of tires shall be equipped throughout with an automatic sprinkler system.

903.2.9.3 Additions or remodels – Group-S Occupancies

An automatic fire sprinkler system shall be provided throughout all buildings containing a Group S occupancy where any of the following conditions is created as a result of a remodel or addition:

1. The fire area is increased beyond the areas specified in Table 903.2.
2. A Group S-1 fire area exceeds 12,000 square feet.
3. A Group S-1 fire area is located more than three stories above grade plane.
4. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.
5. A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet.

(32) Section 903.2.11.7 is added to read:

903.2.11.7 Group U Occupancy special requirements

An automatic sprinkler system shall be provided throughout new buildings and portions thereof used as Group U occupancies, and when an addition or remodel occurs affecting a Group U Occupancy as provided in this section.

Exceptions:

1. Detached Group U occupancies 3000 square feet or less in area
2. Agricultural exempt buildings and agricultural buildings as approved by the Fire Code Official.

903.2.11.7.1 Group U accessory areas

For a U Occupancy less than 3000 square feet in area: In addition to the occupancy separations of California Building Code Chapter 5, an automatic fire sprinkler system shall be installed throughout all accessory areas of a U Occupancy regardless of the mixed-use ratio.

(33) Table 903.2 is added to the California Building Code, to read:

Table 903.2

<u>Existing Building Area</u>	<u>Allowable Area Increase</u>
<u>0-1000 sq ft: 200%</u>	<u>(c)</u>
<u>1001-4000 sq ft: 100%</u>	<u>(a)(c)</u>
<u>Greater than 4000 sq ft: 50%</u>	<u>(a)(b)(c)</u>

(a) A 2000 sq ft. maximum increase is allowed

(b) Maximum cumulative allowable area is 6000 square feet

(c) Fire sprinklers are required when additions to Limited Density Owner-Built Rural Dwellings (as described in Sonoma County Code Chapter 7-A) exceed 640 square feet in area.

(34) Section 903.2.11.8 is added to read:

903.2.11.8 Changes of Occupancy.

When any change of occupancy occurs where the proposed new occupancy classification is more hazardous as determined by the Fire Code Official including the conversion of residential buildings to condominiums, the building shall meet the fire sprinkler requirements for a newly constructed building.

(35) Section 903.2.11.9 is added to read:

903.2.11.9 Elevation of existing buildings

An automatic fire extinguishing system shall be installed throughout all existing buildings when the building is elevated to: three or more stories, or more than 35 feet in height, from grade to the exposed roof.

Exceptions:

1. An automatic fire-extinguishing system need not be provided when the area above 35 feet is provided for aesthetic purposes only and is a non-habitable space.

2. An automatic fire-extinguishing system need not be provided when existing single-family and two-family dwellings are elevated to comply with the requirements of Chapter 7B of the Sonoma County Code, provided that all of the following conditions are met:

(a) The elevation creates a building no more than three stories in height.

(b) Two approved exits are provided for the highest floor, including a third story having less than 500 square feet of floor area.

(c) Approved interconnected smoke alarms are installed at each floor level and in all sleeping rooms, and hallways adjacent to sleeping rooms.

(d) There is no expansion or modification of use other than installation of the exits required by subparagraph (b) above and a utility room less than 100 square feet. The space created at ground level by the elevation shall be used only as a private parking garage or as unused vacant space.

(e) Any addition to the building after the elevation shall require installation of an automatic fire-extinguishing system.

(36) Section 903.2.18 of the California Building Code is deleted.

(37) New Section 903.2.18 of the California Building Code is added to read:

903.2.18 Group U private garages and carports accessory to Group R-3 occupancies.

Carports with habitable space above, attached garages, and detached Group U structures greater than 3000 square feet in area containing a use similar to a: B Occupancy, S Occupancy, or M Occupancy which is accessory to Group R-3 occupancies, shall be protected by residential fire sprinklers in accordance with this section. Residential fire sprinklers shall be connected to, and installed in accordance with, an automatic residential fire sprinkler system that complies

with Section R313 of the California Residential Code or with NFPA 13D. Fire sprinklers shall be residential sprinklers or quick-response sprinklers, designed to provide a minimum density of 0.05 gpm per square foot over the area of the garage and/or carport, but not to exceed two sprinklers for hydraulic calculation purposes. Garage doors shall not be considered obstructions to sprinkler placement.

(38) Section 903.4.2 of the California Building Code is deleted.

(39) New Section of the California Building Code is added to read:

903.4.2 Alarms.

At least one exterior approved audible device activated by the water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system shall be connected to every automatic fire alarm system in an approved location, and approved audible devices shall be connected to every automatic sprinkler system for the purpose of occupant notification. Every new fire alarm system installed for the purpose of evacuation, including those systems activated solely by fire sprinkler systems shall be designed so that all occupants of the building shall be notified audibly and visually.

(40) Section 905.3.1 is amended to read as follows:

905.3.1 Height.

In other than R-3 and R-3.1 occupancies, Class III standpipe systems shall be installed throughout at each floor level where any of the following occur:

1. Buildings where the floor level of the highest story is located more than 30 feet above the lowest level of fire department vehicle access.
2. Buildings that are ~~four~~ three or more stories in height.
3. Buildings where the floor level of the lowest story is located more than 30 feet below the highest level of fire department vehicle access.
4. Buildings that are two or more stories below the highest level of fire department vehicle access.
5. On the roof of buildings three or more stories in height.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet above the lowest level of fire department vehicle access.
3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider:
  - 5.1. Recessed loading docks for four vehicles or less; and
  - 5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

(41) Section 905.9 is amended to read as follows:

905.9 Valve supervision

Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall also be transmitted to the control unit.

Exceptions:

1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision.
2. ~~Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.~~

(42) Section 907.2.8.1 is amended to read as follows:

907.2.8.1 Manual fire alarm system for R-1 Occupancies

A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-1 occupancies.

Exceptions:

- ~~1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, exit court or yard.~~
2. 1. Manual fire alarm boxes are not required throughout the building when the following conditions are met.
  - ~~2-1~~ 1.1 The building is equipped throughout with an automatic fire sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
  - ~~2-2~~ 1.2 Notification devices will activate within each residential unit upon sprinkler water flow.
  - ~~2-3~~ 1.3 At least one manual fire alarm box is installed in an approved location.

(43) Section 1505.1 of the California Building Code is amended to read:

1501.1 Scope.

~~(a)~~ 1. General. Except as otherwise provided in subsection ~~(b)~~ (2), the roof covering assembly on any structure regulated by this code shall be as specified in Table No. 1505.1 and as classified in Section 1505.

~~(b)~~ 2. Roof Covering Assembly on Specified Structures. Notwithstanding any other provision of this code, the roof-covering assembly on the following structures regulated by this code shall be a Class A roof-covering assembly as classified in Section 1505.2.

~~1-~~ (a) Any new structure regulated by this code;

~~2-~~ (b) Any existing structure regulated by this code when more than fifty percent (50%) of the roof area of the structure is re-roofed;

~~3-~~ (c) Any addition regulated by this code when the addition creates a new roof and the floor area of any single floor of the addition exceeds six hundred forty (640) square feet.

~~(e)~~ 3. Roof-covering Assembly. The roof-covering assembly includes the roof deck, underlayment, interlayment, insulation and covering which is assigned to a roof-covering classification.

~~(d)~~ 4. The following types of structures are exempt from this requirement:

~~1-~~ (a) Greenhouses.

~~2-~~ (b) Patio covers.

~~3-~~ (c) Fabric membrane structures when the fabric is certified as "flame retardant" by the State Fire Marshall.

~~4-~~ (d) Residential vehicle covers.

~~5-~~ (e) Awnings.

~~6-~~ (f) Sod roofs.

(44) Section 3405.6 is added to Chapter 34, Section 3405 "Repairs" of the California Building Code, for Repair and Reconstruction of Existing Buildings to read:

3405.6 Seismic Design and Evaluation Procedures. Seismic design and evaluation procedures shall conform to the provisions of this chapter and Chapter 1, Section 101.5.4 of the 2010 International Existing Building Code.

(45) Section 3405.7 is added to Chapter 34, Section 3405 “Repairs” of the California Building Code, for Repair and Reconstruction of Existing Buildings to read:

3405.7 Wind Design. Wind design of existing buildings shall be based on the procedures specified in the building code.

(46) Section 3405.8 is added to Chapter 34, Section 3405 “Repairs” of the California Building Code, for Repair and Reconstruction of Existing Buildings to read:

3405.8 Unsafe Conditions. Regardless of the extent of the structural damage, unsafe conditions shall be eliminated.

(47) Section 3405.9 is added to Chapter 34, Section 3405 “Repairs” of the California Building Code, for Repair and Reconstruction of Existing Buildings to read:

3405.9 Referenced Standards. Referenced standards for evaluation and rehabilitation of existing buildings shall conform with Chapter 15 of the 2010 International Existing Building Code.

~~(b) (B)~~ (B) The ~~2007~~ 2010 California Mechanical Code Chapters 1—17 and Appendix ~~Chapters 1, A, B C, and D,~~ is adopted and incorporated herein by reference, save and except such portions as are deleted, modified or amended as follows:

(1) Section ~~108.8.3~~ 1.8.8.3, Appeals, ~~of Chapter I, Division I,~~ of the California Mechanical Code is amended to read as follows:

1.8.8.3. Appeals. Appeals to orders, decisions or determinations of the Building Official relative to the requirements of this code shall be made in accordance with Sections 7-3 and 7-4 of the Sonoma County Code. Except as otherwise provided in law, any person, firm or corporation adversely affected by a decision, order or determination by a city, county or city and county relating to the application of building standards published in the California Building Standards Code, or any other applicable rule or regulation adopted by the Department of Housing and Community Development, or any lawfully enacted ordinance by a city, county or city and county, may appeal the issue for resolution to the local appeals board or housing appeals board as appropriate. The local appeals board shall hear appeals relating to new building construction and the housing appeals board shall hear appeals relating to existing buildings.

(2) Section 110.0 of the California Mechanical Code ~~Appendix Chapter 1, Division II,~~ entitled Board of Appeals, is hereby deleted.

(3) Section 114.4 of the California Mechanical Code ~~Appendix Chapter 1, Division II,~~ is amended to read as follows:

Section 114.4 Expiration. Unless otherwise authorized, every permit issued by the Permit and Resource Management Department under the provisions of this code shall expire by limitation three (3) years from the date of permit issuance. The chief building official may limit a permit to a lesser time period when necessary to abate dangerous or substandard conditions. The chief building official may extend this time period when such extension is warranted, including (1) to correct an error by the department, (2) when a legal action prevents tire project from being completed within the three year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

Before any work can be recommenced on any expired permit, a new permit shall first be obtained. The new permit shall be obtained for all work necessary to finish tire project including work already completed that has not been previously inspected and approved by the department. The building standards for the work authorized by the new permit shall be as described in Section ~~108.3.1~~ 1.8.3.1, Chapter I, Division I, as to the erection and construction of dwellings and appurtenant structures for which construction was lawfully commenced or approved prior to the effective date of this ordinance.

The fees for the new permit shall be based on the current fee schedule at full value of the previously permitted work minus the value of the work inspected and approved prior to expiration of the permit plus the full value of any new work not previously permitted per PRMD Expired Permit Policy

(4) Section 115.1 ~~is~~ of the California Mechanical Code ~~Appendix~~ Chapter 1, Division II, is hereby deleted.

(5) Section 115.2 of Chapter 1, Division II, of the California Mechanical Code ~~Appendix 3~~ is amended to read as follows:

115.2 Permit Fees. The fee for each permit shall be set forth by separate fee ordinance of the board of supervisors.

(6) Section 115.4 of the California Mechanical Code, Chapter 1, Division II, ~~Appendix 4~~ is amended to read as follows:

115.4 Expiration of Plan Review. If no permit is issued within one year following the date of application, the application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the building official. If, after such expiration, the original plans are resubmitted within 180 days following such expiration, the plan review fee shall be 25% of that otherwise required. No application shall be renewed in this fashion more than once. In order to further renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. The chief building official may extend this time period when such extension is warranted, including but not limited to (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the allowed three year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

~~(e)~~ (C) The ~~2007~~ 2010 California Plumbing Code Chapters 1-16~~A~~ and Appendices ~~4~~, A, B, D, ~~E, F~~, G, I, K, and L are adopted and incorporated herein by reference, save and except such portions as are deleted, modified or amended as follows:

(1) Section 108.8.3 of the California Plumbing Code is amended to read as follows:

108.8.3 Appeals. Appeals to orders, decisions or determinations of the Building Official relative to the requirements of this code shall be made in accordance with Sections 7-3 and 7-4 of the Sonoma County Code.

(2) Section 203.0 of the California Plumbing Code is amended to add the following definition: Administrative Authority — The chief building official.

(3) Section 305.0 of the California Plumbing Code is amended to add the following sections:

305.4 Every dwelling or other building or place where persons congregate, reside or are employed shall be provided with an adequate number of water flush toilets connected to a sewage disposal system which shall consist of a public sewer connection or a septic tank and a system of underground drains for the disposal of the tank effluent, or other systems approved by the chief building official. Such system shall be constructed to meet the requirements of construction and maintenance provided in this chapter and the codes adopted hereby.

Exception: A facility for the boarding of horses as defined in Sonoma County Zoning Regulations Definitions § 26-02-140 may have one part time or full time employee without being required to meet this requirement.

305.5 No privy, including vault privies, chemical privies, pit privies or cesspools shall be constructed, maintained or used except upon written approval of the Director of Permit and Resource Management Department unless otherwise specifically permitted by law.

305.6 It is unlawful to discharge from any privy, cesspool, septic tank, container, sewer pipes or conduits not connected to a public sewer system, sewage, polluted or contaminated water or any matter of substance offensive, injurious or dangerous to public health where such water overflows any land whatsoever, including tideland, or where such water empties, flows, seeps or drains into or adversely affects any springs, streams, rivers, lakes, other waters or any public highway within the County of Sonoma.

(4) Section 103.3.4 of the California Plumbing Code Appendix 1 is amended to read as follows:

Section 103.3.4 Expiration. Unless otherwise authorized, every permit issued by the Permit and Resource Management Department under the provisions of this code shall expire by limitation three (3) years from the date of permit issuance. The chief building official may limit a permit to a lesser time period when necessary to abate dangerous or substandard conditions. The chief building official may extend this time period when such extension is warranted, including but not limited to (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the allowed three-year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

Before any work can be recommenced on any expired permit, a new permit shall first be obtained. The new permit shall be obtained for all work necessary to finish the project including work already completed that has not been previously inspected and approved by the department. The building standards for the work authorized by the new permit shall be as described in Section 108.3.1 as to the erection and construction of dwellings and appurtenant structures for which construction was lawfully commenced or approved prior to the effective date of this ordinance.

The fees for the new permit shall be based on the current fee schedule at full value of the previously permitted work minus the value of the work inspected and approved prior to expiration of the permit plus the full value of any new work not previously permitted per PRMD Expired Permit Policy.

(5) Section 103.4.1 of the California Plumbing Code Chapter 1, Division II ~~Appendix 1~~ is amended to read as follows:

103.4.1 Permit Fees. Each applicant shall pay for each permit, at the time of issuance, a fee in accordance with fee schedule adopted by the board of supervisors.

(6) Section 103.4.2 is hereby deleted.

(7) Section 103.4.3 of the California Plumbing Code Chapter 1, Division II ~~Appendix 1~~ is amended to read as follows:

103.4.3 Expiration of Plan Review. If no permit is issued ~~within~~ within one year following the date of application, the application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the building official. If, after such expiration, the original plans are resubmitted within 180 days following such expiration, the plan review fee shall be 25% of that otherwise required. No application shall be renewed in this fashion more than once. In order to further renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. The chief building official may extend this time period when such extension is warranted, including but not limited to (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the allowed three-year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

(8) The phrase "abutting lot" as used in Section 721.2 and Appendix Chapter K Section K1 G of the California Plumbing Code, includes:

(i) (a) An unimproved lot connected to another lot by an easement provided the lots are in common ownership;

(ii) (b) An improved lot connected to another lot by an easement. The lots need not be under common ownership so long as the lot owner has an easement over the abutting lot sufficient for private sewage disposal subject to approval of the chief building official.

(9) In Table K-1 of the California Plumbing Code, the first sentence under "NOTE" shall be deleted due to the general topographic nature of Sonoma County. Horizontal distances between parts of a leaching system shall be determined by the Director of Permit and Resource Management.

(10) Section K-3 of Appendix Chapter K of the California Plumbing Code, 1998 Edition is amended by deleting Item 3, the exception thereto and Item 5.



~~(4)~~ (D) The ~~2007~~ 2010 California Electrical Code, Articles ~~89~~ 89.101, 89.108, 90, Chapters 1-9, Annex A through G including Annex H is adopted and incorporated herein by reference and amended as follows:

(1) Section ~~89.108.3, 89.108.8.3~~, Appeals, of the California Electrical Code, is amended as follows:

~~89.108.3~~ 89.108.8.3 Appeals. Appeals to orders, decisions or determinations of the Building Official relative to the requirements of this code shall be made in accordance with Sections 7-3 and 7-4 of the Sonoma County Code.

(2) Section 80.15 of Annex H of the California Electrical Code is hereby deleted.

~~(2)~~ (3) Section ~~80.23(B)(1)+5~~ of Annex ~~G~~ H of the California Electrical Code is amended by adding Section ~~I~~ to read as follows:

~~80.23(B)(1)+5~~ (4) Violation penalties. Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official, or of the a permit or certificate issued under the provisions of this code, shall be subject to an investigation fee equal to the amount of the permit fee, whether or not a permit is then or subsequently issued. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this code nor from any penalty prescribed by law.

~~(3)~~ (4) Section 80.19 of annex ~~H~~ G of the California Electrical code is amended by adding the following: Section I: ~~Section~~ 80.19 (I) Expiration. Unless otherwise authorized, every permit issued by the Permit and Resource Management Department under the provisions of this code shall expire by limitation three (3) years from the date of permit issuance. The chief building official may limit a permit to a lesser time period when necessary to abate dangerous or substandard conditions. The chief building official may extend this time period when such extension is warranted, including but not limited to (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the three year time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

Before any work can be recommenced on any expired permit, a new permit shall first be obtained. The new permit shall be obtained for all work necessary to finish the project including work already completed that has not been previously inspected and approved by the department. The building standards for the work authorized by the new permit shall be as described in Section 108.3.1 as to the erection and construction of dwellings and appurtenant structures for which construction was lawfully commenced or approved prior to the effective date of this ordinance.

The fees for the new permit shall be based on the current fee schedule at full value of the previously permitted work minus the value of the work inspected and approved prior to expiration of the permit plus the full value of any new work not previously permitted per PRMD Expired Permit Policy.

~~(4)~~ (5) Section 80.19 (E) of Annex ~~H~~ G of the California Electrical Code is amended to read as follows:

80.19 (E) Permit Fees. The fee for each electrical permit shall be as set forth in a separate fee ordinance of the board of supervisors.

~~(5)~~ (6) Section 80.19 of Annex ~~H~~ G of the California Electrical Code is amended by adding the following to Section J:

~~445.4~~ 80.19(J) Expiration of Plan Review. If no permit is issued within one year following the date of application, the application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the building official. If, after such expiration, the original plans are resubmitted within 180 days following such expiration, the plan review fee shall be 25% of that otherwise required. No application shall be renewed in this fashion more than once. In order to further renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. The chief building official may extend this time period when such extension is warranted, including but not limited to (1) to correct an error by the department, (2) when a legal action prevents the project from being completed within the allowed ~~three year~~ time frame, or (3) in the interest of public health and safety. The chief building official's decision regarding the limitation period shall be final.

(7) Section 80.27 of Annex H of the California Electrical Code is hereby deleted.

(E) The 2010 California Residential Code Chapters 1-9 and Appendix H, are adopted and incorporated herein by reference, save and except such portions as are deleted, modified or amended as follows:

(1) Chapter 1, Division II, is hereby deleted. California Building Code Chapter 1, Division II shall be referenced and incorporated herein.

(2) Section 1.1.3.1.2 of the California Residential Code is amended to read as follows:

1.1.3.1.2 Utility and Miscellaneous Group U.

Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to the following:  
Agricultural buildings

Aircraft hangars accessory to a one- or two-family residence (See Section 412.5 of the California Building Code)

Barns

Carports

Fences more than 6 feet high

Grain silos accessory to a residential occupancy

Greenhouses

Livestock shelters

Private garages

Pool houses accessory to a one- or two-family residence

Private riding arenas accessory to a one- or two-family residence

Private home studios accessory to a one- or two-family residence

Retaining walls

Sheds

Storage building accessory to a one- or two-family residence

Stables

Tanks

Towers

(3) Section R109.1.5.2 of the California Residential Code is amended to read as follows:

R109.1.5.2 Fire sprinkler system inspections

Where a fire sprinkler system is required, the building official shall require: a pressure test and pre-concealment inspection, and flow test. Such inspections and tests shall be completed by the fire code official. The pressure test shall require that the installed piping be pressurized to 200 psig for not less than two-hours. Fire sprinkler piping shall not be concealed from view until inspected, pressure tested and approved.

(4) Section R309.6 of the California Residential Code is amended to read as follows:

R309.6 Fire sprinklers.

Carports with habitable space above and attached garages shall be protected by residential fire sprinkler systems in accordance with this section. Residential fire sprinklers shall be connected to, and installed in accordance with, a fire sprinkler system that complies with Section R313 or NFPA 13D. Fire sprinklers shall be residential sprinklers or quick-response sprinklers, designed to provide a minimum density of 0.05 gpm/sq ft over the area of the garage and/or carport, but not to exceed ~~two~~ four sprinklers for hydraulic calculation purposes. Garage doors shall not be considered obstructions with respect to sprinkler placement.

Exception 1: An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing carports and/or garages that do not have an automatic residential fire sprinkler system installed in accordance with this section.

Exception 2: Detached garages and carports without a dwelling unit above.

(5) Section R313.1 of the California Residential Code is amended to read as follows:

R313.1 Townhouses automatic fire sprinkler system

An automatic fire sprinkler system shall be installed in new townhouses. An automatic fire sprinkler system shall be required when additions or alterations are made to existing townhouses in accordance with Sonoma County Code Section 7-13(A)(34) Table 903.2.

~~Exception: An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.~~

(6) Section R313.2 of the California Residential Code is amended to read as follows:

R313.2 One- and two-family dwellings automatic fire systems

An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings. An automatic fire sprinkler system shall be required when additions or alterations are made to existing one- and two-family dwellings in accordance with Sonoma County Code Section 7-13(A)(34) Table 903.2.

~~Exception: An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are already not provided with an automatic residential fire sprinkler system.~~

Exceptions:

1. Single-story detached Group U occupancies 3,000 sq. ft. or less in area.
2. Single-story detached Group S occupancies 3,000 sq. ft. or less in area.
3. A room or area which is used for storage only and that does not contain a bathroom, cooking or refrigeration facilities or connections for such facilities which is constructed above a detached garage, Group U Occupancy, or Group S occupancy.
4. Agricultural exempt buildings and agricultural buildings as approved by the Fire Code Official.
5. Private riding arenas, provided that all of the following conditions are met:
  - a. The building has a minimum of 60 feet of clearance to property lines or other structures on all sides.
  - b. The building has an on-site water supply complying with the requirements of this code.
  - c. The building has an annual fire inspection by the chief.
  - d. The portions of the building that are not part of the private riding arena are equipped with an automatic fire-extinguishing system and are separated from the private riding arena by area separation walls meeting the requirements of the Building Code.

(7) Section R313.3.1.2 of the California Residential Code is added to read as follows:

R313.3.1.2 Water-flow alarm

One exterior approved audible device shall be connected to every automatic sprinkler system in an approved location. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a building fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

(8) Section R313.3.1.3 of the California Residential Code is added to read as follows:

R313.3.1.3 Spare sprinkler heads

A spare-head cabinet shall be installed in an approved location with a head wrench at least three spare heads of a type similar to those used in the system.

(9) Section R313.3.1.3 of the California Residential Code is added to read as follows:

R313.3.5.2 Required capacity

The water supply shall have the capacity to provide the required design flow rate for sprinklers for a period of ~~time as follows~~ 10 minutes. Where a well system, a water supply tank system, a pump, or a combination thereof is used, the water supply shall serve both domestic and fire sprinkler systems. Any combination of well capacity and tank storage shall be permitted to meet the capacity requirements.

~~1. 7 minutes for dwelling units one story in height and less than 2,000 square feet (186m<sup>2</sup>) in area. For the purpose of determining the area of the dwelling unit, the area of attached garages and attached open carports, porches, balconies and patios shall not be included.~~

~~2. 10 minutes for dwelling units two or more stories in height or equal to or greater than 2,000 square feet (186m<sup>2</sup>) in area. For the purpose of determining the area of the dwelling unit, the area of attached garages and attached open carports, porches, balconies and patios shall not be included.~~

(10) Section R313.3.8.1 of the California Residential Code is amended to read as follows:

R313.3.8.1 Preconcealment inspection

The following items shall be verified prior to the concealment of any sprinkler system:

1. Sprinklers are installed in all areas as required by Section R313.3.1.1
2. Where sprinkler water spray patterns are obstructed by construction features, luminaries or ceiling fans, additional sprinklers are installed as required by Section R313.3.2.4.2.
3. Sprinklers are the correct temperature rating and are installed at or beyond the required separation distances from heat sources as required by sections R313.3.2.1 and R313.3.2.2.
4. The pipe size equals or exceeds the size used in applying Tables R313.3.6.2(4) through R313.3.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section R313.3.6.1, the size used in the hydraulic calculation.
5. The pipe length does not exceed the length permitted by Tables R313.3.6.2 (4) through R313.3.6.2.(9) or, if the piping system was hydraulically calculated in accordance with Section R313.3.6.1, pipe lengths and fittings do not exceed those used in the hydraulic calculations.
6. Nonmetallic piping that conveys water to sprinklers is listed for use with fire sprinklers.
7. Piping is supported in accordance with the pipe manufacturer's and sprinkler manufacturer's installation instructions.
8. The piping system is hydraulically pressure tested to 200 psig for at least 2 hours.

(11) Section R313.3.8.2 of the California Residential Code is amended to read as follows:

R313.3.8.2 Final inspection

The following items shall be verified upon completion of the system:

1. Sprinklers are not painted, damaged or otherwise hindered from operation.
2. Where a pump is required to provide water to the system, the pump starts automatically upon system water demand.
3. Pressure-reducing valves, water softeners, water filters, or other impairments to water flow that were not part of the original design have not been installed.

4. The sign or valve tag required by Section R313.3.7 is installed and the owner's manual for the system is present.
5. A spare-head cabinet is installed in an approved location with a wrench at least three spare heads of a type similar to those used in the system.
6. A flow tested is conducted to confirm system functions as designed.

(12) Section R322.1.6 and R322.1.7 are hereby deleted, new Section R322.1.6 is added as follows:

R322.1.6 Flood Damage Protection

see Sonoma County Code Chapter 7B-11A for Flood Damage Protection

(13) Section R327.1.3 of the California Residential Code is amended to read as follows:

R327.1.3 Application.

New buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing agency constructed after the application date shall comply with the provisions of this chapter.

Exceptions:

1. Buildings of an accessory character classified as a Group U occupancy and not exceeding 120 square feet in floor area, when located at least 30 feet from property lines or an applicable building.
2. Buildings of an accessory character classified as Group U occupancy less than 1000 square feet in floor area located at least 50 feet from property lines or an applicable building.
3. Buildings less than 3000 square feet in floor area classified as a Group U Agricultural Building, as defined in Section 202 of this code (also see Appendix C – Group U Agricultural Buildings), when located at least 50 feet from an applicable building.
4. Additions to and remodels of buildings originally constructed prior to the application date.

(14) Section R907.7 of the California Residential Code is added to read as follows:

R907.7 Photovoltaic Panels/Modules

Solar photovoltaic panels/modules shall comply with the requirements of this code and the California Fire Code

(F) The 2010 California Green Building Standards Code Chapters 1-9 and Appendix A4 (Tier 1) and Appendix A5 (Tier 1) are adopted as mandatory provisions and incorporated herein by reference.

~~(G)~~ (G) 2010~~07~~ California Energy Code is adopted and incorporated by reference.

~~(H)~~ (H) 2010~~07~~ California Historical Building Code is adopted and incorporated by reference.

~~(I)~~ (I) 2010~~07~~ California Referenced Standards Code is adopted and incorporated by reference.

~~(J)~~ (J) 2010~~07~~ California Administrative Code is adopted and incorporated by reference.

(K) The 2010 California Existing Building Code Chapter 1, Section 101.5.4 and Chapter 15 is adopted and incorporated herein by reference

**(f) Section 7-14.5, Stream setback for structures requiring a building permit, is revised to read:**

Sec. 7-14.5. - Stream setback for structures requiring a building permit.

All structures requiring a building permit or an agricultural exemption shall be set back from streams as measured from the toe of the stream bank outward, a distance of 2.5 times the height of the stream bank plus thirty (30) feet, ~~as measured from the toe of the stream bank outward~~, or thirty (30) feet outward from the top of the stream bank, whichever distance is greater, unless a greater distance is established in the general plan, local coastal program, and/or zoning code. If the top of the stream bank cannot be determined by visual analysis, it shall be determined by hydraulic analysis as the water surface elevation for the 100 year event plus 1.5 feet. Stream bank height is the change in elevation from the top of bank and the lowest toe of bank.

(a) Exceptions. An exception to the 30 feet portion may be approved by the chief building official if one or more of the following criteria apply:

- (1) Constructability. The stream setback in makes the lot unbuildable for the primary use of the base planning district.
- (2) Minor Expansion. The proposed development involves a minor expansion of an existing structure. A minor expansion shall not exceed 25% of the existing structure by area, and shall not expand in a direction toward, or closer to, any stream.
- (3) Existing Structures. The proposed development involves only the maintenance or restoration of an existing structure or a non-structural use.
- (4) Stream bank restoration or stabilization. The proposed development involves the restoration or stabilization of a stream bank.

(b) Exception provisions. An exception may be approved by the chief building official if the following provisions are met:

- (1) Minimize disturbance. The removal of the natural vegetation is minimized or compensated by planting of natural vegetation within the setback.
- (2) Riparian function. The applicant demonstrates that the encroachment into the setback area will be accomplished with a minimum damage to the riparian functions and no reasonable alternative exists.
- (3) Soils report. The applicant submits a soils report that is acceptable to the chief building official. The soils report shall address the soil stability relative to the foundation of the proposed development and relative to the potential destabilizing effect the stream may or may not have on the proposed development.

**(g) Section 7-18, Local conditions, is revised to read:**

Sec. 7-18. - Local conditions and findings.

Modifications to the building standards in the referenced codes are made pursuant to the authority granted in the California Health and Safety Code Section 17958.7 and 18941.5 based on local climatic, geographical or topographical conditions. A copy of the findings for such modifications is on file with the Sonoma County clerk of the board.

**(h) Section 7-19, Definitions, is revised to read:**

Sec. 7-19. - Definitions.

Whenever any of the following names or terms are used herein or in any codes adopted by reference by this chapter, unless the context directs otherwise, such names or terms so used shall have the meaning ascribed thereto by this section as follows:

- (a) "Building official," "chief building official," "chief electrical inspector," "administrative authority," and similar references to a chief administrative position shall mean the director of the permit and resource management department of the county or his or her designee; provided, however, that where such terms are used in conjunction with those duties imposed upon the public health officer, the terms shall mean the public health officer of the county.
- (b) The "building division," "electrical division," or "plumbing division" shall mean the permit and resource management department of the county.
- (c) "City" shall mean the county when referring to a political entity, or an unincorporated area of the county.
- (d) "City clerk" means "county clerk" and/or "clerk of the board of supervisors."
- (e) "City council" or "mayor" means the board of supervisors.
- (f) "Board of appeals" shall mean the local appeals board and housing appeals board provided for in Section 7-3.
- (g) "California Building Code" or "2010~~07~~ California Building Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 2, 2010~~07~~ California Building Code, which incorporates by adoption the 2009~~06~~ International Building Code, published by the International Code Council, with necessary California amendments.
- (h) "California Building Standards Administrative Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 1, 2010~~07~~ California Building Standards Administrative Code, which incorporate by adoption the 2010~~07~~ edition of the California Administrative Code published by the International Code Council.
- (i) "California Electrical Code" or "2010~~07~~ California Electrical Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 3, California Electrical Code, which incorporate by adoption the 2005 2008 edition of the National Electric Code, with necessary California amendments.
- (j) "California Energy Code" or "2010~~07~~ California Energy Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 6, 2010~~07~~ California Energy Code, ~~which incorporate by adoption the 1997 edition of the Model Energy Code of the International Code Council, with necessary California amendments.~~
- (k) "California Fire Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 9, 2010~~07~~ California Fire Code, which incorporate by adoption the edition of the ~~Uniform Fire Code of the International Fire Code Institute,~~ with necessary California amendments.
- (l) "California Historical Building Code" or "2010~~07~~ California Historical Building Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 8, 2010~~07~~ California Historical Building Code.
- (m) "California Mechanical Code" or "2010~~07~~ California Mechanical Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 4, 2010~~07~~ California Mechanical Code, which incorporate by adoption the 2009~~06~~ edition of the Uniform Mechanical Code published by International Association of Plumbing and Mechanical Officials, with necessary California amendments.
- (n) "California Plumbing Code" or "2010~~07~~ California Plumbing Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 5, 2010~~07~~ California Plumbing Code, which incorporate by adoption the 2006 edition of the Uniform Plumbing Code published by the International Association of Plumbing and Mechanical Officials, with necessary California amendments.
- (o) "California Referenced Standards Code" or "2010~~07~~ California Referenced Standards Code" means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 12, 2010~~07~~ California Referenced Standards Code.
- (p) "California Residential Code" or "2010 California Residential Code", means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 2.5 California Residential Code, which incorporate by the 2009 International Residential Code, with necessary California amendments.
- (q) "California Green Building Standards Code" or 2010 California Green Building Standards Code", means the regulations adopted by the California Building Standards Commission in California Code of Regulations, Title 24, Part 11, 2010 California Green Building Standards Code.

- ~~(q)-(r)~~ "Local coastal program" means the Sonoma County local coastal program.
- ~~(s)~~ "General plan" means the Sonoma County general plan.
- ~~(t)~~ "Stream" means any natural channel with bed and banks containing flowing water or showing evidence of having contained flowing water (e.g., deposit of rock, sand, gravel, or soil).
- ~~(u)~~ "Zoning Code" means Chapters 26 and 26C of this code.

**(i) Article IV. Private Actions for Damage Caused by Unpermitted Placement of Fill Within Flood-Prone Urban Areas, is deleted in its entirety, as follows:**

~~Article IV. Private Actions for Damage Caused by Unpermitted Placement of Fill Within Flood-Prone Urban Areas~~

~~Sec. 7-30. Right to Institute civil proceedings.~~

~~Any person whose property is damaged by the unpermitted placement of fill within a flood-prone urban area, may institute a civil proceeding for injunctive relief, money damages and whatever other relief the court deems appropriate.~~

~~(Ord. No. 4906 § 3 (part), 1995.)~~

~~Sec. 7-31. Relief to be granted.~~

~~In any action hereunder, relief shall be granted upon a showing of damage to property which results from unpermitted placement of fill within a flood-prone urban area, for which a grading permit is required pursuant to Section 7-13 of this code.~~

~~(Ord. No. 4906 § 3 (part), 1995.)~~

~~Sec. 7-32. Attorney's fees to be awarded.~~

~~Upon motion, a court shall award reasonable attorney's fees to a successful party who brings an action hereunder. The remedy available under this article shall be in addition to any other existing remedies which may be available.~~

~~(Ord. No. 4906 § 3 (part), 1995.)~~

**SECTION II.** Chapter 7A of the Sonoma County Code is hereby amended as follows:

**(a) Section 7A-3, Intent and application, is revised to read:**

Sec. 7A-3. - Intent and application.

The provisions of this chapter shall apply to the lawful construction, enlargement, conversion, alteration, repair, use, maintenance, and occupancy of limited density owner-built rural dwellings and appurtenant structures.

It is the intent of this chapter that the requirements contained herein shall apply to seasonally or permanently occupied dwellings, hunting shelters, guest cottages, private vacation homes and recreational shelters located in rural areas. The intent of this chapter shall not apply to transient vacation rentals.

Owner-built rural dwellings shall be permitted only in conformance with the allowable General Plan residential density on parcels of at least 20 acres in size which parcels are designated in the Sonoma County General Plan as RRD, LEA, LIA, or DA. ~~Undeveloped, General Agriculture, Orchards & Vineyards.~~

Construction shall be limited to one ~~single family~~ rural dwelling unit per legally established parcel of land. ~~as shown on the Assessors Parcel Maps.~~

**(b) Section 7A-4, Existing buildings, is revised to read:**

Sec. 7A-4. - Existing buildings.



The provisions of this chapter regulating the erection and lawful construction of dwellings and appurtenant structures shall not apply to existing structures as to which lawful construction is commenced or approved prior to the effective date of this chapter. Requirements relating to use, maintenance, and occupancy shall apply to all dwellings and appurtenant structures approved for construction or constructed before or after the effective date of this chapter.

Existing structures shall be issued a Certificate of Occupancy by the Building Inspection Department upon meeting the requirements of this section.

**(c) Section 7A-5, Amendments to insure compliance, is revised to read:**

Sec. 7A-5 - Amendments to insure compliance.

For the purposes of this chapter the sale, lease, renting or employee occupancy of owner-built structures shall not occur within three years of the issuance of a Certificate of Occupancy. ~~shall be presumptive evidence that the structure was erected for the purpose of sale, lease or renting.~~

**(d) Section 7A-6, Abatement of substandard buildings, is revised to read:**

Sec. 7A-6 - Abatement of substandard buildings.

All structures or portions thereof which are determined by the enforcing agency to constitute a substandard building shall be declared to be a public nuisance and shall be abated by repair, rehabilitation, or removal in accordance with Sonoma County Code, Chapter 1, Section 1-7.1, and Health and Safety Code Sections 17980 through 17995. ~~of this subsection~~ In cases of extreme hardship to owner-occupants of the dwellings, the appropriate local body should provide for deferral of the effective date of orders of abatement.

**(e) Section 7A-7, Board of appeals for limited density owner-built dwelling regulations, is revised to read:**

Sec. 7A-7 - Board of appeals for limited density owner-built dwelling regulations.

Requirements for the Board of Appeals and the appeal process shall be consistent with Chapter 7, Section 7-3 and 7-4 of the Sonoma County Code.

~~Composition: The board of Appeals shall consist of five (5) members: one civil engineer, one sanitarian, one owner-builder, one alternate energy consultant, and one person at large. The board of appeals shall be appointed by and serve at the pleasure of the Sonoma County board of supervisors. The building official or designate should be the secretary of the board of appeals, without voting privilege.~~

~~Function and Authority: The board of appeals shall adopt reasonable rules and regulations for conducting its investigations and render all decisions and findings in writing to the appropriate administrative authority. The board shall also keep a record of all interpretations, decisions and findings rendered by said board or obtained by the board from the State Commission of Housing and Community Development and shall provide notice to the appellant of the board's decision. Such records shall be available for review by the public or any governmental agency. The board may rule in matters of interpretation and application of owner built housing regulations, the suitability of alternate materials and methods of construction. Board decisions shall be in conformance with any applicable state or local statute or regulations.~~

**(f) Section 7A-11, Permits, is revised to read:**

Sec. 7A-11 - Permits.

Permits shall be required for the construction of rural dwellings and appurtenant structures.

Exemptions: Permits shall not be required for small or unimportant work, or alterations or repairs that do not present a health or safety hazard, and which are in conformance with local zoning requirements or property standards. For the purposes of this exemption, small or unimportant work shall be that which meets the criteria for an "A-BLD" permit. The determination, if any, of what work is properly classified as small or unimportant or without relation to health and safety hazards is to be made by the appropriate local agencies.

**(g) Section 7A-13, Application, is revised to read:**

Sec. 7A-13. - Application.

To obtain a permit, the applicant shall first file an application therefore with the designated enforcement agency. Permit applications shall contain the following information: (1) name and mailing address of the applicant; (2) address and location of the proposed structure(s); (3) a general description of the structure(s) which shall include mechanical installations with all clearances and venting procedures detailed, electrical installations, foundation, structural, and construction details; (4) a plot plan indicating the location of the dwelling in relation to property lines, other structures, sanitation and bathing facilities, water resources, and water ways; (5) approval for the installation of a private sewage disposal system or alternate waste disposal means from the Permit and Resource Management Department ~~local health enforcement agency~~; (6) a stipulation by the applicant that the building or structure is to be owner-built; (7) the signature of the owner or authorized agent; (8) the use or occupancy for which the work is intended; (9) and any other data or information as may be required by statute or regulation.

**(h) Section 7A-14, Plans, is revised to read:**

Sec. 7A-14. - Plans.

Plans shall consist of a general description of the structure(s), including all necessary information to facilitate a reasonable judgment of conformance by the enforcing agency. This may include a simplified diagram of the floor plan, structural cross-section and site elevation in order to determine the appropriate dimensions of structural members. Architectural drawings and structural analyses shall not be required except for structures of complex design, or non-conventional construction, or unusual conditions for which the enforcement agency cannot make a reasonable judgment of conformance to this chapter based upon the general description and simplified plan(s).

**(i) Section 7A-16, Modifications, is revised to read:**

Sec. 7A-16. - Modifications.

Modifications to the design, materials, and methods of construction are permitted, provided that the structural integrity of the building or structure is maintained, the building continues to conform to the provisions of this chapter and the enforcement agency is notified in writing of the ~~intended~~ proposed modification. The determination of structural integrity and conformance of the proposed modifications to the provisions of this chapter shall be made by the Chief Building Official.

**(j) Section 7A-18, Inspections, is revised to read:**

Sec. 7A-18. - Inspections.

All construction or work for which a permit is required ~~may~~ shall be subject to inspection by the designated enforcement agency in conformance with Chapter 1, Section 109 of the California Building Code.

**(k) Section 7A-19, Issuance of inspections, is revised to read:**

Sec. 7A-19. - ~~Issuance of~~ Required inspections.

~~All~~ Inspections of the building or structure(s) shall be conducted in accordance with Chapter 1, Section 109.3 of the 2010 California Building Code for minimum inspection requirements to determine compliance with the provisions of

~~this chapter. after the structure(s) is completed and ready for occupancy, in order to determine compliance with the provisions of this chapter. Structures of conventional or simple construction shall be inspected at a single inspection.~~

**(l) Section 7A-20, Special inspections, is revised to read:**

Sec. 7A-20. - Special inspections.

~~Special inspections shall be in accordance with Chapter 17 of the California Building Code. Additional inspections may be conducted under the following circumstances: An inspection may be conducted where there is a reasonable expectation that the footing will be subjected to serious vertical or lateral movement due to unstable soil conditions; or the application indicates that interior wall coverings or construction elements will conceal underlying construction, electrical or mechanical systems; or where an unconventional construction method is indicated which would preclude examination at a single inspection.~~

**(m) Section 7A-21, Inspection waivers, is revised to read:**

Sec. 7A-21. - Inspection waivers.

Inspections for electrical, mechanical or plumbing installations may be waived by the enforcement agency for structures which do not contain electrical, ~~or~~ mechanical, or plumbing installations, or for alterations, additions, modifications or repairs that do not involve electrical, ~~or~~ mechanical, or plumbing installations; ~~or where the applicant stipulates in writing that the work has been conducted in compliance with the permit application and the provisions of this chapter.~~

**(n) Section 7A-22, Inspection requests and notice, is revised to read:**

Sec. 7A-22. - Inspection requests and notice.

It shall be the duty of the applicant to notify the enforcement agency that the construction is ready for inspection and to provide access to the premises. Inspections shall be requested by the applicant at least (248) hours in advance of the intended inspection. Inspections shall be performed on the next business day after the request has been received. ~~It shall be the duty of the enforcement agency to notify or inform the applicant of the day during which inspection is to be conducted.~~

**(o) Section 7A-24, Temporary occupancy, is revised to read:**

Sec. 7A-24. - Temporary occupancy.

The use and occupancy of a portion or portions of a dwelling or appurtenant structure prior to the completion of the entire structure shall be allowed when approved by the Chief Building Official, and provided that approved sanitary facilities are available at the site, and that the work completed does not create any condition to an extent that endangers life, health, or safety of the public or occupants. The occupants of any such uncompleted structure shall assume sole responsibility for the occupancy of the structure or portion thereof.

**(p) Section 7A-26, Definitions, is revised to read:**

Sec. 7A-26. - Definitions.

~~a.~~ 1. Enforcing/Enforcement Agency. "Enforcing or enforcement agency" shall mean the permit and resource management department, unless otherwise specifically noted.

2. California Model Codes. "California Model Codes" shall mean State regulations that govern the design and construction of buildings, associated facilities and equipment, known as "building standards," and in particular, Title 24 of the California Code of Regulations, Parts 1-12, as adopted by the California Building Standards Commission.

3. Conventional Construction. "Conventional Construction" shall mean structures of simple design and construction with no unusual conditions that conform with Chapter 23 of the California Building Code.

4.b. Greywater. "Greywater" shall include all domestic waste water obtained from the drainage of showers, bathtubs, ~~kitchen sinks~~, lavatories, and laundry facilities, exclusive of kitchen sinks, toilets, bidets, dishwashers, or any waste water utilized for the transport and disposal of body eliminations.

5.e. Limited Density Rural Dwelling. "Limited density rural dwelling" is any structure consisting of one or more habitable rooms intended or designed to be occupied by one family with facilities for living and sleeping, with use restricted to rural areas that fulfills the requirements of this chapter.

6. Non-Conventional Construction. "Non Conventional Construction" shall mean structures of complex design and construction which may contain unusual conditions, as determined by the Chief Building Official, and do not conform with the conventional construction requirements of Chapter 23 of the California Building Code.

7.d. Owner-Built.

(a) "Owner-built" shall mean constructed by any person or family who acts as the general contractor for, or as the provider of part or all of the labor necessary to build housing to be occupied as the principal residence of that person or family, and not intended for sale, lease, rent or employee occupancy.

(b) For the purposes of this chapter, the sale, lease, renting or employee occupancy of owner-built structures shall not occur within three (3) years of the issuance of a certificate of occupancy. ~~shall be presumptive evidence that the structure was erected for the purpose of sale, lease or renting.~~

8.e. Rural. For the purposes of this chapter only, "rural" shall mean those unincorporated areas of counties designated and zoned by the ~~appropriate local~~ enforcing agency for the application of this chapter. Suitable areas may include those wherein the predominant land usage is agricultural and undeveloped.

9.f. Sound Structural Condition. A structure shall be considered to be in "sound structural condition" when it is constructed and maintained in substantial conformance with the California Model Codes, accepted construction principles, ~~technical codes~~, or performance criteria (engineering analysis) which provide minimum standards requirements for the stressing of structural members; footing sizes when related to major load-bearing points; proper support of load-bearing members; nailing schedules where essential to general structural integrity; and provisions for adequate egress, ventilation, sanitation, and fire safety. Conditions which would not render a structure unsound are ~~the minor deflections or elasticity of structural members~~, ceiling heights, size or arrangement of rooms, heating, plumbing, and electrification requirements, alternative materials, appliances or facilities, or methods of construction, or building designs that perform to protect health and safety for the application and purpose intended, and any other provisions of this chapter regulating the construction, use and occupancy of dwellings and appurtenant structures.

10.g. Substandard Building. A "substandard building" is a structure or portion thereof in which there exists any hazardous condition, as determined by the Chief Building Official, to an extent that endangers the life, limb, health, or safety of the occupants. Except as amended by the provisions of this chapter, Health and Safety Code Section 17920.3 Chapter 10 of the Uniform Housing Code, 1976 Edition, as published by ICBO, shall be the determining criteria for compliance with the standards of this chapter and the defining of a substandard building.

**(q) Section 7A-28, Intent of general requirements, is revised to read:**

Sec. 7A-28. - Intent of general requirements.

It shall be the purpose and intent of this chapter to permit the use of ingenuity and preferences of the builder, and to allow and facilitate the use of alternatives to the specifications prescribed by the ~~Uniform Technical Codes~~ California Model Codes to the extent that a reasonable degree of health and safety is provided by such alternatives, and that the materials, methods of construction, and structural integrity of the structure shall perform in application for the purpose intended. To provide for the application of this chapter, it shall be necessary for the enforcement agency to ~~exercise reasonable judgment in~~ determining the compliance of appropriate structures with the general and specific requirements of this article.

**(r) Section 7A-29, Technical codes to be basis of approval, is revised to read:**

Sec. 7A-29. - Technical codes California Model Codes to be a basis of approval.

Except as otherwise required by this chapter, dwellings and appurtenant structures constructed pursuant to this part shall conform with the latest applicable editions of the California Building, Residential, Electrical, Plumbing, Mechanical, Energy, Fire and Green Building Standards Codes. ~~need not conform with the construction requirements prescribed by the latest applicable editions of the Uniform Building, Plumbing, and Mechanical Codes, the National Electrical Code, or other applicable technical codes; however, it is not the intent of this section to disregard nationally accepted technical and scientific principles relating to design, materials, methods of construction, and structural requirements for the erection and construction of dwelling and appurtenant structures as are contained in the Uniform Technical Codes.~~ Such codes shall be a basis for approval.

**(s) Section 7A-30, Construction requirements, is revised to read:**

Sec. 7A-30. - Construction requirements.

1. a. ~~a.~~ Structural Requirements. Buildings or structures constructed pursuant to this chapter may be of any type of construction which will provide for a sound structural condition. Structural hazards which result in an unsound condition and which may constitute a substandard building are delineated by Section 1001 (c), Uniform Housing Code (most recent edition).

2. b. ~~b.~~ Foundations. Pier foundations, stone masonry footings and foundations, pressure treated lumber, poles, or equivalent foundation materials or designs may be used provided that the bearing and lateral stability as documented by engineering analysis, is sufficient for the purpose intended.

3. e. ~~c.~~ Materials. Owner-produced or used materials and appliances may be utilized unless found not to be of sufficient strength or durability to perform the intended function; owner-produced and/or used lumber that has been graded, or shakes and shingles may be utilized unless found to contain dry rot, excessive splitting, or other defects obviously rendering the material unfit in strength or durability for the intended purpose.

4. d. ~~d.~~ Mechanical Requirements. ~~Fireplaces and h~~Heating and cooking appliances and gas piping installed in buildings constructed pursuant to this chapter shall be installed and vented in accordance with the requirements of the latest applicable editions of the California Mechanical and Plumbing Codes. ~~Chapter 37 of the Uniform Building Code and Chapter 9 of the Uniform Mechanical Code and Chapter 12 of the Uniform Plumbing Code.~~ Alternate materials and methods of venting shall be permitted if substantially equivalent in safety and durability. The latest edition of the various codes shall apply.

5. e. ~~e.~~ Heating Capacity. ~~When a~~ A heating facility or appliance ~~is shall be installed, in each dwelling it shall be~~ subject to the provisions of this chapter; however, there shall be no specified requirement for heating capacity or temperature maintenance. The use of a solid fuel or solar heating device ~~shall may~~ be deemed as complying with the requirements of this section. Conditioned space shall be in accordance with the requirements of the latest applicable edition of the California Energy Code. Wood burning appliances shall be in conformance with Chapter 7C of the Sonoma County Code. ~~If non-renewable fuel is used in these dwellings, rooms so heated shall meet current insulation standards.~~

6. f. ~~f.~~ Electrical Requirements. No dwelling or appurtenant structure constructed pursuant to this chapter shall be required to be connected to a source of electrical power, or wired, or otherwise fitted for electrification, except as set forth below in Section 7A-30(7) ~~g.~~ of this section.

7. g. ~~g.~~ Installation Requirements. Where electrical wiring or appliances are installed, they shall be installed in accordance with the provisions of the latest applicable edition of the California Electrical Code, National Electrical Code adopted by the State Housing and Community Development Commission for single family dwellings.

Exceptions to Installation Requirements. In structures where electrical usage is confined to one or more rooms of a structure, the remainder of the structure shall not be required to be wired or otherwise fitted for electrification unless

the enforcement agency determines ~~otherwise for conformance to this chapter. that electrical demands are expected to exceed the confinement and capacity of that room(s). In such instances, the enforcement agency may require further electrification of the structure.~~

It is the intent of this subsection to apply to buildings in which there exists a workshop, kitchen, or other single room which may require electrification, and where there is no expectation of further electrical demand. ~~The enforcement agency shall, at the time of a permit application or other appropriate point, advise the applicant of the potential hazards of violating this section.~~

Service Limit. The main service equipment shall be limited in size to the intended load capacity of the installed electrical facilities.

~~8. h.~~ Room Requirements. There shall be no requirements for room dimensions provided that there is adequate light and ventilation and adequate means of egress in conformance with the latest applicable editions of the California Model Codes. In single family dwellings not exceeding two stories in height where, due to the location or to the surrounding terrain, emergency rescue from the exterior is not feasible, egress windows from sleeping spaces may be omitted when an additional doorway or an approved exit escape hatch is provided for egress from such rooms. The doorways provided shall open directly to the exterior of the building or shall open onto corridors or passageways which lead to individual exterior exits. The corridors or passageways provided shall not cross nor shall they follow the same route in whole or in part of the building exterior. Approved exit escape hatches shall be installed in accordance with the terms of their approval.

Exception: Openable windows or exterior doors for emergency egress or rescue from sleeping rooms of a single-family dwelling may be omitted when such rooms are located on a mezzanine floor or loft area which is at least fifty percent (50%) open to the floor below. Such mezzanine or loft area shall have at least two (2) means of evacuation acceptable to the enforcing authority and may include stairways, ladders, escape hatches, or any other design or arrangement which will allow egress in the event of an emergency.

**(t) Section 7A-31, Sanitation requirements, is revised to read:**

Sec. 7A-31. - Sanitation requirements.

Sanitation facilities, including the type, design, and number of facilities, as required and approved by the ~~director~~ Chief Building Official of permit and resources management department, shall be provided to the dwelling sites. It shall not be required that such facilities be located within the dwelling.

**(u) Section 7A-32, Plumbing specifications, is revised to read:**

Sec. 7A-32. - Plumbing specifications.

Where conventional plumbing, in all or in part, is installed within the structure, it shall be installed in accordance with the latest applicable edition of the California Plumbing Code. ~~Uniform Plumbing Code (latest edition)~~. Alternative materials and methods shall be permitted provided that the design complies with the intent of the code, and that such alternatives shall perform to protect health and safety for the intended purpose.

**(v) Section 7A-33, Sanitation facilities, is revised to read:**

Sec. 7A-33. - Sanitation facilities.

A water closet shall not be required when an alternate system is provided and has been approved by the ~~director~~ Chief Building Official of permit and resources management department. Where an alternative to the water closet is installed, a system for the disposal or treatment of ~~greywater waste water~~ shall be provided to the dwelling. Greywater systems shall be designed according to water availability, use and discharge in accordance with Ch 16A of the latest applicable edition of the California Plumbing Code. ~~The design, use, and maintenance standards of such systems shall be the prerogative of the director of permit and resources management department.~~

A bathtub or shower and a lavatory, or alternate bathing and washing facility approved by the Chief Building Official ~~director~~ of permit and resources management department, shall be provided to the dwelling site.

**(w) Section 7A-34, Water supply, is revised to read:**

Sec. 7A-34. – Domestic water supply.

a. ~~Potable Water. Domestic water supply~~ Potable water shall be available on the dwelling site, although such water need not be pressurized. ~~Quantity of water to be in accordance with requirements established by the director of permit and resources management department.~~ Where water delivery is pressurized, appropriate piping shall be installed in accordance with the provisions of this chapter. Quantity of water shall be in accordance with Chapter 7, Section 7-12 of the Sonoma County Code.

b. Supply for Fire Fighting. A minimum storage of two thousand five hundred ~~(2,000-2,500)~~ gallons shall be available. Storage may be in tanks, swimming pools, ponds or other similar storage facilities.

c. Where pressurized water delivery system is incorporated into a structure greater than 640 square feet, and are located a minimum of 100 feet from all other buildings, fire sprinklers shall be installed. An automatic fire sprinkler system shall be also be required when additions or alterations are made to existing Limited Density Owner-Built Rural Dwellings in accordance with Sonoma County Code Section 7-13(A)(34) Table 903.2

**SECTION III. Chapter 7D1 of the Sonoma County Code is hereby amended as follows:**

**(a) Section 7D1-2, Application, is revised to read:**

7D1-2 Application.

(A) The provisions of this Chapter shall apply to the construction of any new residential or commercial building(s) within the County, not otherwise identified as an exempt building in this Chapter, for which a building permit, as required, has been applied and accepted as complete by the County's building division on or after the effective date of this Chapter.

(B) Neither this Chapter, nor any resolution adopted to implement the provisions of this Chapter, shall affect the permissible use of property, density or intensity of development, design or improvement standards or other applicable standards required under this Code or by state law, all of which shall continue to apply and remain in full force and effect.

(C) The following buildings or projects are exempt from the requirements of this Chapter:

(1) Any building for which a building permit application has been submitted to the County meeting the standards for building permit acceptance by the County's Permit and Resource Management Department prior to the effective date of this Chapter, unless any such applications expire prior to issuance of a building permit; and

(2) Any repair, remodel or renovation of any building, including but not limited to tenant improvements, re-roofing of any building, repair of any structure damaged as a result of force majuer, barrier removal projects for accessibility, and seismic retrofit projects; and

(3) Swimming Pools; and

(4) Any residential addition or expansion; and

~~(5) Any new commercial construction project less than 5,000 square feet; and~~

~~(6) (5)~~ Any agricultural exempt or agricultural building as defined in Chapter 7 of this Code or in the California Building Code; and

~~(7) (6)~~ Any construction for which an infeasibility exemption is granted pursuant to section 7D1-8 of this Chapter

(D) In the event that any provision in this Chapter conflicts with state law, state law shall control.

**(b) Section 7D1-3, Definitions, is revised to read:**

7D1-3 Definitions.

For the purposes of this Chapter, certain words and terms are defined as follows:

(A) “Applicant” shall mean any individual, firm or any other entity that applies to the County for the applicable permits to undertake any construction within the County.

(B) “Green Building Rater” shall mean a person or organization qualified as an approved special inspector by the County, ~~which shall include certification by the applicable green building rating system body~~ to perform inspections and provide documentation related to the inspection and verification of buildings covered by this Chapter.

(C) “Building” shall have the meaning set forth in the California Energy Code, except that it shall not be deemed to include existing commercial or industrial buildings that are newly conditioned.

(D) “Green Building Documentation” shall mean all documentation required ~~by a green building rating system~~ indicating the ~~compliance threshold level~~ required by the County has been achieved. Green Building Documentation includes specific requirements as set forth in this Chapter and by resolution.

~~(E) “Compliance Threshold” shall mean the minimum number of points or rating level within a Green Building Rating System that must be attained for a particular covered building type.~~

~~(E) (F)~~ “Final Inspection” shall mean the final inspection and approval required by the California Building Code when a building is completed and ready for occupancy and use.

~~(F) (G)~~ “California Energy Efficiency Standard (Title 24, part 6)” refers to the most recent enforced version of the coded section of the California Building Code.

~~(G) (H)~~ “Compliance Official” shall mean the County’s Chief Building Official or his or her designee who is responsible for enforcing this Chapter.

~~(H) (I)~~ “Green Building” shall mean a whole systems approach to the design, construction, and operation of buildings and structures that helps mitigate the environmental, economic, and social impacts of construction, demolition and renovation. Green building practices recognize the relationship between natural and built environments and seek to minimize the use of energy, water, and other natural resources and provide a healthy, productive indoor environment.

~~(I) (J)~~ “Green Building Project Checklist” shall mean a checklist or scorecard developed for the purpose of calculating a green building rating.

~~(K) “Green Building Rating” means the point or performance threshold proposed or achieved for the respective rating system used for a covered building.~~

~~(L) “Green Building Rating System” shall mean the rating system associated with a specific guideline, set forth by resolution that is used to determine compliance thresholds.~~

~~(J) (M)~~ “Green Building Worksheet” shall mean a worksheet or form developed by the County that specifies information to be submitted with an application for a building permit for a building subject to this Chapter. The Green Building Worksheet will specify the form and content of the required documentation.

~~(K) (N)~~ “County Certified” shall mean a building(s) where a person certified by the county as a green building rater ~~LEED® Accredited Professional~~ working with the applicant on the building(s) has submitted Green Building Documentation to the County’s Building Official ~~setting forth the measures that will be taken to achieve compliance with the requirements of this Chapter and, following completion of the building(s), a LEED® Accredited Professional~~ green building rater has provided certification that the building(s) has met ~~the applicable compliance threshold pursuant to the applicable Green Building Rating System under this Chapter. The LEED® Accredited Professional for purposes of providing county certification pursuant to this Chapter need not be qualified as a special inspector with the County.~~

~~(L) (O)~~ “Stop Order” shall mean a written notice to stop work, as defined in the California Building Code, which is served by the County’s Building Official on any person engaging in work contrary to the provision of this Code.

~~(M) (P)~~ “Structure” shall mean that which is built or constructed, an edifice or building of any kind or any piece of work artificially build or composed of parts joined together in some definite manner and permanently attached to the ground, as defined in the California Building Code.

~~(N) (Q)~~ “LEED® Accredited Professional” shall mean any person who has earned a credential as a LEED® Accredited Professional from the U.S. Green Building Council in accordance with their standards and requirements.

**(c) Section 7D1-4, Compliance, is revised to read:**



#### 7D1-4 Compliance.

(A) The County's Chief Building Official or designee will be charged with enforcing the provisions of this Chapter. A building permit subject to the provisions of this Chapter shall not be issued by the County's Permit and Resource Management's Building Division unless the required Green Building Documentation submitted with the permit application meets the requirements of this Chapter. A final inspection for a building permit subject to the requirements of this Chapter will not be approved unless the work authorized under a permit has been constructed in accordance with the plans and requirements of this Chapter.

(B) The latest adopted edition of the California Green Building Standards Code shall be the building standards used for compliance. ~~green building guidelines, rating systems and compliance thresholds for all buildings subject to the provisions of this Chapter shall be established by Resolution of the Board of Supervisors. All buildings subject to the provisions of this Chapter shall be constructed and maintained using the green building guidelines and ratings systems as adopted by Resolution.~~

**(d) Section 7D1-5, Green Building Documentation; Submission with Building Permit Application, is revised to read:**

#### 7D1-5 Green Building Documentation; Submission with Building Permit Application.

In conjunction with an application for issuance of a building permit for any building covered by this Chapter, the applicant shall submit documents indicating how compliance with this Chapter will be achieved. The Green Building Documentation shall include the Green Building Project Checklist from a Green Building Rater providing that (i) the applicant has taken into account the requirements of this Chapter in the planning process; and (ii) if the building is built in conformance with the building plans, including the items identified in the Green Building Documentation, the building will achieve the standards required by this Chapter. ~~The Green Building Documentation shall include a verification plan noting how each green building measure or provision will be verified through visual inspections, documentation, or other means during construction.~~

**(e) Section 7D1-6, Verification, is revised to read:**

#### 7D1-6 Verification.

(A) The Green Building Rater shall verify that the green building measures and provisions indicated in the Green Building Documentation are being implemented through inspections during the construction of the building. In lieu of, or in addition to visual inspections, the applicant may submit documents, such as purchase receipts, verifying that green building measures and provisions have been implemented.

(B) If at any time during the construction of a building, the Compliance Official determines that the building(s) does not comply with any portion of the Green Building Documentation, a stop-work order may be issued. At the discretion of the Compliance Official, the stop-work order may apply to the portion of the building(s) that is not in compliance or to the entire building(s). The stop-work order shall remain in effect until the Compliance Official determines that the building(s) is in compliance with the Green Building Documentation and the provisions of this Chapter.

(C) During the verification process for any building, flexibility may be exercised by the Green Building Rater in communication with the Compliance Official to substitute green building elements ~~the approved credits or points~~ of the Green Building Documentation for the building with other green building elements ~~credits or points allowed within the approved rating system~~, as applicable. Substitution may occur upon the reasonable request of the applicant and when the Green Building Rater determines and documents that the originally approved green building elements ~~credits~~ are no longer feasible or the substitute green building elements ~~credits~~ are an equivalent or a superior alternative to the original green building elements ~~credits~~. Substitution of green building elements ~~credits or points~~ shall in no event result in a building not achieving compliance with the California Green Building Standards Code ~~established compliance thresholds~~, or result in the failure to demonstrate compliance with the California Building Energy Efficiency Standards (Title 24, part 6) of the California Building Code for the building in effect at the time the building permit was issued.

**(f) Section 7D1-7, Determination of Compliance, is revised to read:**

**7D1-7 Determination of Compliance.**

(A) Prior to approving a final inspection for a building(s) subject to the provisions of this Chapter, the Compliance Official shall review the documentation submitted by the applicant, along with inspection records and certificates submitted by the Green Building Rater(s), and determine whether the applicant has achieved the required compliance ~~threshold~~, and demonstrate compliance with the provisions of this Chapter and the California Building Energy Efficiency Standards (Title 24, part 6) of the California Building Code. If the Compliance Official determines the applicant has met the requirements of this Chapter, the Compliance Official shall make a final determination that the project is ready for a final inspection, provided the project has received approval of all inspections required by the California Building Code.

(B) If the Compliance Official determines that the building(s) is not in compliance with the Green Building Documentation and has failed to meet the required compliance threshold, the Compliance Official will require additional green building measures to mitigate the noncompliance of the building(s). Mitigation measures may include, but are not limited to, landscaping the project to decrease water and energy consumption, use of energy-efficient fixtures and equipment, and education of the building's occupants and owners regarding on-going energy and resource savings techniques. If the mitigation measures are or will be implemented and appropriately documented to the satisfaction of the Compliance Official, and the building(s) fully comply with the California Building Energy Efficiency Standards (Title 24, part 6) of the California Building Code, a certificate of occupancy shall be issued.

(C) The Compliance Official may waive the initial review of Green Building Documentation when he or she determines that review of the Green Building Documentation can be carried out during the regular building permit plan review process, such as when multiple buildings of a subdivision are submitted at different times, but the buildings are very similar in nature.

**(g) Section 7D1-8, Infeasibility Exemption, is revised to read:**

**7D1-8 Infeasibility Exemption.**

(A) If an applicant for a building permit covered by this Chapter believes that circumstances exist that make it infeasible for the building(s) to meet the requirements of this Chapter, the applicant may apply for an exemption as set forth in this section. In applying for an exemption, the burden is on the applicant to show infeasibility, and to clearly demonstrate continued compliance with the California Building Energy Efficiency Standards (Title 24, part 6) of the California Building Code.

(B) If an applicant for a building permit covered by this Chapter believes such circumstances exist, the applicant may apply for an exemption of one or more items on the Green Building Project Checklist at the time that he or she submits the Green Building Documentation required under section 7D-5, however the applicant may under no circumstances fail to demonstrate continued compliance with the California Building Energy Efficiency Standards (Title 24, part 6) of the California Building Code. The applicant shall indicate in the Green Building Documentation ~~the maximum number of credits or points~~ the green building elements he or she believes is feasible for the building(s) and the circumstances that he or she believes make it infeasible to fully comply with this Chapter. An infeasibility exemption shall be made if any one of the following conditions exist:

- (1) There is a lack of available or affordable Green Building Raters; or
- (2) There is a lack of commercially available green building materials and technologies; or
- (3) There is conflict with the compatibility of the requirements of the ~~Green Building Rating System and the~~ California Green Building Standards Code; or
- (4) ~~The Green Building Rating Systems do not include enough green building measures that are compatible with the scope of the building.~~

(C) If the Compliance Official determines it is infeasible for the applicant to meet the requirements of this Chapter based on the information provided, and determines that the proposed project modifications demonstrate continued compliance with the California Building Energy Efficiency Standards (Title 24, part 6) of the California Building Code, the Compliance Official shall return a copy of the Green Building Documentation to the applicant marked "Approved with Exemption." If an exemption is granted, the applicant must still comply with this Chapter in all other respects and shall be required to achieve the compliance threshold, less the credits or points that would have been achieved for the exempted items.

(D) If the Compliance Official determines that it is possible for the applicant to fully meet the requirements of this Chapter, the Compliance Official shall so notify the applicant in writing. The applicant may resubmit the Green Building Documentation in full compliance with the requirements of this Chapter. Anyone may appeal the determination of the Compliance Official to grant or deny an exemption, pursuant to section 7D-9 of this Chapter.

#### **SECTION IV. Chapter 7D2 of the Sonoma County Code is hereby amended as follows:**

##### **(a) Section 7D2-6, General Compliance Requirements, is revised to read:**

###### **7D2-6 General Compliance Requirements.**

In addition to the requirements of the 2008 Building Energy Efficiency Standards, the following general compliance requirements shall apply to all permit applications subject to this chapter:

(A) Residential Buildings. When an application for a building permit involves a new residential building, the performance approach specified in Section 151 of the 2008 Building Energy Efficiency Standards must be used to demonstrate that the TDV Energy of the proposed building is less than the TDV Energy of the standard building per the requirements of the 2010 California Green Building Standards Code as amended and adopted by Chapter 7, Sonoma County Code, 2008-2011 Green Point Rated system.

(B) Documentation. In order to demonstrate compliance with the requirements of this Section, a permit applicant may be required to submit supplementary forms and documentation in addition to the building drawings, specifications, and standard Title 24 report forms, as deemed appropriate by the County's City's building official.

##### **(b) Section 7D2-7, General Compliance Requirements, is revised to read:**

###### **7D2-7 Enforcement.**

(A) In addition to any other remedies provided in this article, any violation of this article may be enforced by civil action brought by the county. In any such action, the county may seek as appropriate, any or all of the following:

- 1) A temporary restraining order, preliminary and permanent injunction;
- 2) Reimbursement for the costs of any investigation, inspection or monitoring survey which led to the establishment of the violation, and for the reasonable costs of preparing and bringing administrative action under this article;
- 3) Costs incurred in removing, correcting, or terminating the adverse effect resulting from the violation.

(B) Cumulative Remedies. The foregoing remedy shall be deemed nonexclusive, cumulative and in addition to any other remedy the County City may have at law or in equity, including but not limited to injunctive relief to prevent violations of this chapter.

#### **SECTION V. Findings**

Pursuant to Health and Safety Code sections 13143.5 and 17958.7, the Board of Supervisors expressly finds that this ordinance and the changes or modifications made herein to the 2010 edition of the California Building Code including the amendment to the existing fire protection sprinkler and fire safe roofing standards, and the minimum fire safe standards for development within the unincorporated area of the county are reasonably necessary because of

local climatic, geological, and topographical conditions. The Board of Supervisors further finds in connection therewith as follows:

1. Climatic Conditions. Sonoma County has unique climatic conditions. The County is subject to year-round coastal winds. Average yearly rainfall for the County is approximately 30 inches. This rainfall generally occurs during October to April. During the summer months (July, August, September), the prevalent Pacific High Cell creates early morning fog, which assists the natural vegetation in growth. During the summer months, dry winds and vegetation mix to create a hazardous fuel condition. This condition causes grassland and brushland fires each year. While normal temperatures do not exceed 85-90 degrees during the summer months, temperatures can exceed 110 degrees in parts of the County. Particularly during times of high temperatures and low humidity, a fire can move quickly through the County.

Several years of drought conditions have previously occurred in the County, thus reducing available water. Groundwater as well as surface supplies have been affected. This condition has created a situation where lowered water tables, water contamination and increased demand on water systems due to population growth have all negatively impacted water availability for fire protection. These impacts degrade the quality of fire protection and fire suppression activities.

2. Geological Conditions. Sonoma County has geological and geographic characteristics which have scenic appeal for residents and visitors. The County is situated in a primarily rural setting with a rugged coastline forming its western boundary and mountainous areas forming its northern and eastern boundaries. Forested areas and grasslands are located throughout the County. These features create barriers to accessibility for emergency fire equipment and personnel.

The forested areas in the County also contribute to potential fire hazards, particularly when decayed trees, branches, needles and leaves drop to the ground. The dry vegetation and low water availability also cause problems for emergency fire equipment and personnel. The grassland areas in the County also are troublesome. These areas are easily ignitable, and create a potential for major conflagrations.

Further compounding the potential fire hazards, the County has active seismic faults within its boundaries (including the San Andreas Fault). Large portions of the County are within the Alquist-Priolo Special Study Zones. While systems have been developed to study and monitor the activity of earthquakes, science has not yet been able to reliably predict fault activity. New construction may be limited by their respective distances to faults, however, existing structures and replacement of those structures could present a serious problem.

Moreover, the mixture of developed and undeveloped areas within the County creates hazardous conditions when fallen trees, landslides or flooding block access by emergency fire equipment and personnel.

3. Topographical Conditions. The sources of water within the County are directly affected by its topographical layout. The water sources consist of on-site water storage tanks, lakes, pools, wells, mutual water systems and the Sonoma County Water Agency distribution network. Water supplies within the County vary from less than ten (10) gallons per minute to flows in excess of four thousand (4000) gallons per minute. This wide variation causes major problems to fire suppression forces. The roadway system through most of the County is designed around the topographical lay of the land and consists in many cases of narrow, winding roads, steep grades and overhanging tree branches. The grades on roadway surfaces sometimes exceed twenty-five (25) percent, and widths of less than twelve (12) feet are not uncommon.

The topographical conditions also make construction more restricted to the level and semi-level portions of the County. The high concentration of commercial, industrial and residential structures in these areas has the potential to become a significant fire hazard. Further compounding the risk, these structures frequently are constructed of wood for economical and practical reasons. Consequently, there is a substantial risk of conflagration due to the high build out of certain areas in the County.

The topographical nature of the County also lends itself to power failures caused when fallen trees and limbs tear out sections of electrical transmission lines which run throughout the County. These power failures cause electrical pumps to become inactive, and thus, water supplies are interrupted. Vehicular accidents also have been known to

interrupt this pumping operation. Narrow roads and heavy congestion increase the risk of vehicular accidents that cause such interruptions.

4. The preceding findings identify the local climatic, geological and topographical conditions which this Board has considered in adopting this ordinance. The Board finds that these conditions make the modifications as set forth herein reasonably necessary as such modifications will assist in mitigating the local climatic, geological and topographical conditions. These findings are intended to support each of the amendments to the building standards made as part of this ordinance based on local conditions.

5. Additional findings as to building standards and administrative changes.

(a) Agricultural building exemption permit - Sonoma County includes many acres of rural, agricultural property. Crops are grown and livestock raised throughout the County, and the preservation of agricultural land, farming, and the right to farm is an important goal of County government. Exemption from building permit requirements saves farmers the unnecessary cost of building permits and the inevitable delays in the construction process which are caused by permits and inspections, and helps to preserve the tradition of family farms, dairies, vineyards, and stables. Agricultural buildings are still required to conform to building standards notwithstanding this administrative exemption.

(b) Floating home standards, - Sonoma county is bordered on the south by a region of San Francisco Bay characterized by marshes and mud flats. This area would be an ideal location for low cost housing. In the event that permanent or semi-permanent houseboats are proposed in this area as low cost housing that meet the appropriate environmental regulations, it is important to have building standards in place for such structures. The model codes do not specifically address floating homes.

(c) 10 foot fence permit exemption. Sonoma County is overpopulated with deer due to lack of predators. Deer not only destroy farm crops, but individual gardens and landscaping. A 6 foot fence will not keep deer from entering property, but a 10 foot fence forms a more effective barrier.

(d) Grading . Sonoma County has many areas with unstable soil conditions, including expansive and liquefiable soils. It is prone to long periods of dry weather which shrinks expansive soils, and heavy downpours, which promote landslides. In addition it is in an extremely active seismic area. These conditions not only make for unstable land under proposed structures, but cause pollution into streams and rivers when soil is disturbed. Special grading regulations are needed under these conditions.

(e) Septic requirements and plumbing code modifications. Sonoma county is unique in having many heavily developed areas where hilly and mountainous forested terrain, narrow winding roads, and existing watershed conditions have made the installation of sewer systems difficult. For this reason, most of these areas rely on septic systems, and there is the constant threat of pollution of rivers, streams, and the groundwater from human waste. (More than 85% of the developed parcels are served by septic systems.) These regulations are in place to insure that where human waste is discharged and no sewer is available, that it will be discharged into a properly functioning septic system.

#### **(f) Green Building**

(1) The design, construction, and maintenance of buildings and structures within the county can have a significant impact on the county's environmental sustainability, resource usage, energy efficiency, waste management, and the health and productivity of residents, workers, and visitors.

(2) Green building design, construction, and operation can have a significant, positive effect on resource conservation, energy efficiency, waste and pollution generation, and the health and productivity of a building's occupants over the life of the building.

(3) Green building benefits are spread throughout the systems and features of the building. Green buildings can include, among other things, the use of certified sustainable wood products; extensive use of high recycled content products; recycling of waste that occurs during deconstruction, demolition, and construction; orientation and design of a building to reduce the demand on the heating, ventilating, and air conditioning systems; the use of heating, ventilating, and air conditioning systems that provide energy efficiency and improved indoor air quality. selection and use of construction materials that do not emit chemicals that are toxic or irritating to building occupants; the use of water conserving methods and equipment; and installation of alternative energy methods for supplemental energy production.

(4) Requiring commercial and residential projects to incorporate green building measures is necessary and appropriate to achieve the public health and welfare benefits of green building.

**SECTION VI.** Except as added, revised, amended or deleted herein, the remaining provisions of Chapters 7, 7A, 7D1 and 7D2 as previously adopted shall remain in full force and effect.

**SECTION VII.** The Building Official is directed to file a copy of this Ordinance with the California Building Standards Commission of the State of California.

**SECTION VIII.** The provisions of this Code shall not be construed as imposing upon the County of Sonoma any liability or responsibility for damages to persons or property resulting from defective work, nor shall the County of Sonoma, or any official, employee or agent thereof, be held as assuming any such liability or responsibility by reason of the review or inspection authorized by the provisions of this Code of any permits or certifications issued under this Code.

**SECTION IX:** The Board of Supervisors finds and determines that this ordinance is exempt from the California Environmental Quality Act ("CEQA") pursuant to Section 15061(b)(3) of the State CEQA Guidelines as it can be seen with certainty that there is no possibility that this ordinance may have a significant effect on the environment. This finding and determination is based on the environmental determination of the Permit and Resource Management Department for this ordinance. The Director of Permit and Resource Management Department is directed to file a notice of exemption in accordance with CEQA and the State CEQA Guidelines.

**SECTION X.** If any section, subsection, sentence, clause or phrase of this ordinance is for any reason held to be unconstitutional and invalid, such decision shall not affect the validity of the remaining portion of this ordinance. The Board of Supervisors hereby declares that it would have passed this ordinance and every section, subsection, sentence, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared unconstitutional or invalid.

**SECTION XI.** This ordinance shall take effect on January 1, 2011, after its adoption and pursuant to Ordinance No. \_\_\_\_\_, published in summary format prior to adoption and within fifteen (15) days after its adoption, with the names of the Supervisors voting for or against the same, in a newspaper of general circulation published and circulated in the County of Sonoma.

In regular session of the Board of Supervisors of the County of Sonoma introduced on the 19th day of October, 2010, and finally passed and adopted this 2nd day of November, 2010, on regular roll call of the members of said Board by the following vote:

SUPERVISORS:

KERNS \_\_\_\_\_ ZANE \_\_\_\_\_ KELLEY \_\_\_\_\_ CARRILLO \_\_\_\_\_ BROWN \_\_\_\_\_

AYES \_\_\_\_\_ NOES \_\_\_\_\_ ABSENT \_\_\_\_\_ ABSTAIN \_\_\_\_\_ SUPERVISORS:

WHEREUPON, the Chair declared the above and foregoing ordinance duly adopted and

SO ORDERED.

C hair, Board of Supervisors  
ATTEST:

Sandra Burnett, Clerk  
of the Board of Supervisors

## **Appendix: Climate Zone 2 Energy Cost-Effectiveness Study**



# Codes and Standards Title 24 Energy-Efficient Local Ordinances

## Title: Climate Zone 2 Energy Cost-Effectiveness Study

### Prepared for:

Pat Eilert  
Codes and Standards Program  
Pacific Gas and Electric Company

Maril Pitcock  
Government Partnership Program  
Pacific Gas and Electric Company

**Prepared by:**  
Gabel Associates, LLC

Last Modified: September 30, 2010



## Climate Zone 2 Energy Cost-Effectiveness Study

September 30, 2010

Report prepared by:

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## **LEGAL NOTICE**

This report was prepared by Pacific Gas and Electric Company and funded by the California utility customers under the auspices of the California Public Utilities Commission.

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## **1.0 Executive Summary**

This report presents the results of Gabel Associates' research and review of the feasibility and energy cost-effectiveness of building permit applicants exceeding the 2008 Building Energy Efficiency Standards to meet the minimum energy-efficiency requirements of local energy efficiency standards covering **Climate Zone 2**. A local government may use this report as a basis for demonstrating energy cost-effectiveness of a proposed green building or energy ordinance. The study assumes that such an ordinance requires, for the building categories covered, that building energy performance exceeds the 2008 TDV energy standard budget by at least 15%.

The study is also contained in the local government's application to the California Energy Commission (CEC) which must meet all requirements specified in Section 10-106 of the California Code of Regulations, Title 24, Part 1, Article 1: Locally Adopted Energy Standards. An ordinance shall be legally enforceable (a) after the CEC has reviewed and approved the local energy standards as meeting all requirements of Section 10-106; and (b) the ordinance has been adopted by the local government and filed with the Building Standards Commission.

The 2008 Building Energy Efficiency Standards, which took effect on January 1, 2010, are the baseline used to calculate the cost-effectiveness data.

## **2.0 Methodology and Assumptions**

The energy performance impacts of exceeding the performance requirements of the 2008 Title 24 Building Energy Efficiency Standards (2008 Standards) have been evaluated in **Climate Zone 2** using the following residential and nonresidential prototypical building types:

<b>Small Single Family House</b> 2-story 2,025 sf	<b>Large Single Family House</b> 2-story 4,500 sf
<b>Low-rise Multi-family Apartments</b> 8 dwelling units/2-story 8,442 sf	<b>High-rise Multi-family Apartments</b> 40 dwelling units/4-story 36,800 sf
<b>Low-rise Office Building</b> 1-story 10,580 sf	<b>High-rise Office Building</b> 5-story 52,900 sf

### **Methodology**

The methodology used in the case studies is based on a design process for each of the proposed prototypical building types that first meets the minimum requirements and then exceeds the 2008 Standards by 15%. The process includes the following major stages:

#### ***Stage 1: Minimum Compliance with 2008 Standards:***

Each prototype building design is tested for minimum compliance with the 2008 Standards, and the mix of energy measures are adjusted using common construction options so the building first just meets the Standards. The set of energy measures chosen represent a reasonable combination which reflects how designers, builders and developers are likely to achieve a specified level of performance using a relatively low first incremental (additional) cost.

#### ***Stage 2: Incremental Cost for Exceeding 2008 Standards by 15%:***

Starting with that set of measures which is minimally compliant with the 2008 Standards, various energy measures are upgraded so that the building just exceeds the 2008 Standards by 15%. The design choices by the consultant authoring this study are based on many years of experience with architects, builders, mechanical engineers; and general knowledge of the relative acceptance and preferences of many measures, as well as their incremental costs. This approach tends to reflect how building energy performance is typically evaluated for code compliance and how it's used to select design energy efficiency measures. Note that lowest simple payback with respect to building site energy is not the primary focus of selecting measures; but rather the requisite reduction of Title 24 Time Dependent Valuation(TDV) energy at a reasonable incremental cost consistent with other non-monetary but important design considerations. A minimum and

maximum range of incremental costs of added energy efficiency measures is established by a variety of research means. A construction cost estimator, Building Advisory LLC, was contracted to conduct research to obtain current measure cost information for many energy measures; and Gabel Associates performed its own additional research to establish first cost data.

### ***Stage 3: Cost Effectiveness Determination:***

Energy savings in kWh and therms is calculated from the Title 24 simulation results to establish the annual energy cost savings and CO<sub>2</sub>-equivalent reductions in greenhouse gases. A simple payback analysis in years is calculated by dividing the incremental cost for exceeding the 2008 Standards by the estimated annual energy cost savings.

### **Assumptions**

#### ***Annual Energy Cost Savings***

1. Annual site electricity (kWh) and natural gas (therms) saved are calculated using Micropas 8, state-approved energy compliance software for the 2008 Building Energy Efficiency Standards.
2. Average residential utility rates of \$0.18/kWh for electricity and \$1.15/therm for natural gas in current constant dollars; nonresidential rates are time-of-use rate schedules modeled explicitly in the DOE-2.1E computer simulation: PG&E A-6 schedule for electricity and PG&E G-NR1 schedule for natural gas.
3. No change (i.e., no inflation or deflation) of utility rates in constant dollars
4. No increase in summer temperatures from global climate change

#### ***Simple Payback Analysis***

1. No external cost of global climate change -- and corresponding value of additional investment in energy efficiency and CO<sub>2</sub> reduction -- is included
2. The cost of money (e.g., opportunity cost) invested in the incremental cost of energy efficiency measures is not included.

### **3.0 Minimum Compliance with 2008 Standards**

The following energy design descriptions of the following building prototypes just meet the 2008 Standards in Climate Zone 2.

#### **Small Single Family House**

- ☐ 2,025 square feet
- ☐ 2-story
- ☐ 20.2% glazing/floor area ratio

#### **Base Case Design With No Air Conditioner**

<b>Energy Efficiency Measures</b>
R-38 Roof w/ Radiant Barrier R-13 Walls R-19 Raised Floor over Garage/Open at 2nd Floor R-0 Slab on Grade Low E2 Vinyl Windows, U=0.36, SHGC=0.30 Furnace: 80% AFUE Air Conditioner: None R-6 Attic Ducts 50 Gallon Gas Water Heater: EF=0.62

#### **Base Case Design With Air Conditioner**

<b>Energy Efficiency Measures</b>
R-30 Roof w/ Radiant Barrier R-13 Walls R-19 Raised Floor over Garage/Open at 2nd Floor R-0 Slab on Grade Low E2 Vinyl Windows, U=0.36, SHGC=0.30 Furnace: 80% AFUE Air Conditioner: 13 SEER, 11 EER (HERS) Air Conditioner: Refrigerant Charge (HERS) R-6 Attic Ducts 50 Gallon Gas Water Heater: EF=0.62



### **Large Single Family House**

- ☐ 4,500 square feet
- ☐ 2-story
- ☐ 22.0% glazing/floor area ratio

### **Base Case Design With No Air Conditioner**

<b>Energy Efficiency Measures</b>
R-30 Roof w/ Radiant Barrier R-13 Walls R-19 Raised Floor Low E2 Vinyl Windows, U=0.36, SHGC=0.30 (2) Furnaces: 80% AFUE Air Conditioner: None R-6 Attic Ducts Reduced Duct Leakage/Testing (HERS) (2) 50 Gallon Gas Water Heaters: EF=0.60

### **Base Case Design With Air Conditioner**

<b>Energy Efficiency Measures</b>
R-38 Roof w/ Radiant Barrier R-13 Walls R-19 Raised Floor Low E2 Vinyl Windows, U=0.36, SHGC=0.30 (2) Furnaces: 80% AFUE (2) Air Conditioners: 13 SEER R-6 Attic Ducts Reduced Duct Leakage/Testing (HERS) (2) 50 Gallon Gas Water Heaters: EF=0.62

### **Low-rise Multi-family Apartments**

- ☐ 8,442 square feet
- ☐ 8 units/2-story
- ☐ 12.5% glazing/floor area ratio

### **Base Case Design With No Air Conditioner**

<b>Energy Efficiency Measures</b>
R-30 Roof w/ Radiant Barrier R-13 Walls R-0 Slab on Grade Low E2 Vinyl Windows, U=0.36, SHGC=0.30 (8) Furnaces: 80% AFUE Air Conditioner: None R-6 Attic Ducts (8) 40 Gallon Gas Water Heaters: EF=0.63

### **Base Case Design With Air Conditioner**

<b>Energy Efficiency Measures</b>
R-38 Roof w/ Radiant Barrier R-13 Walls R-0 Slab on Grade Low E2 Vinyl Windows, U=0.36, SHGC=0.30 (8) Furnaces: 80% AFUE (8) Air Conditioner: 13 SEER R-8 Attic Ducts (8) 40 Gallon Gas Water Heaters: EF=0.63

### **High-rise Multifamily Apartments**

- ☐ 36,800 sf,
- ☐ 40 units
- ☐ 4-story
- ☐ Window to Wall Ratio = 35.2%

<b>Energy Efficiency Measures to Meet Title 24</b>
R-19 Metal Roof w/ R-10 (2") rigid insulation; cool roof Reflectance = 0.55 Emittance = 0.75
R-19 in Metal Frame Walls
R-4 (1.25" K-13 spray-on) Raised Slab over parking garage
Dual Metal Windows: COG U-factor=0.30, COG SHGC=.54
2 ton 4-pipe fan coil, 84% AFUE boiler, 70-ton scroll air cooled chiller 0.72 KW/ton
Central DHW boiler: 84% AFUE and recirculating system w/ timer- temperature controls with variable speed pump

### **Low-rise Office Building**

- ☐ Single Story
- ☐ 10,580 sf,
- ☐ Window to Wall Ratio = 37.1%

<b>Energy Efficiency Measures to Meet Title 24</b>
R-19 under Metal Deck with 3" rigid (R-15) above
R-19 in Metal Frame Walls
R-0 (un-insulated) slab-on-grade 1st floor
Metal windows: COG U=0.30, COG SHGC=0.54
Lighting = 0.858 w/sf: Open Office Areas: (60) 2-lamp T8 fixtures @58w each; (24) 18w recessed CFLs no lighting controls. Small Offices: (48) 2-lamp T8 fixtures; (40) 18w recessed CFLs, on/off lighting controls. Support Areas: (32) 18w recessed CFLs; (48) 13w CFL wall sconces; no controls.
(3) 10-ton DX units EER=11.1; 82% AFUE furnaces; standard efficiency fan motors; fixed temp. integrated air economizers
R-6 duct insulation w/ducts on roof, HERS verified duct leakage
(1) Tank Gas Water Heaters EF=0.58

### **High-rise Office Building**

- ☐ 5-story
- ☐ 52,900 sf,
- ☐ Window to Wall Ratio = 34.5%

<b>Energy Efficiency Measures to Meet Title 24</b>
R-19 under Metal Deck with 2" rigid insulation above (R-10), Cool Roof Reflectance = 0.55, Emittance = 0.75
R-19 in Metal Frame Walls
R-0 (un-insulated) slab-on-grade 1st floor
Metal windows: Default glazing U=0.71, SHGC = .73
Lighting = 0.858 w/sf: Open Office Areas: (300) 2-lamp T8 fixtures @58w each; no lighting controls; (120) 18w recessed CFLs no lighting controls. Small Offices: (280) 2-lamp T8 58w fixtures on/off lighting controls; (200) 18w recessed CFLs no lighting on/off lighting controls. Support Areas: (160) 18w recessed CFLs no lighting controls; (240) 13w CFL wall sconces; no lighting controls.
(3) 70 ton Packaged VAV system 10.3 EER/80% TE, standard efficiency variable speed fan motors; 25% VAV boxes, hot water reheat on perimeter zones with 82% AFUE boiler, fixed temp. economizer
R-6 duct insulation w/ ducts in conditioned
(1) Boiler (combined with space heat) 82% AFUE

## 4.0 Incremental Cost to Exceed 2008 Standards by 15%

The following tables list the energy features and/or equipment included in the 2008 Standards base design, the efficient measure options, and an estimate of the incremental cost for each measure included to improve the building performance to use 15% less TDV energy than the corresponding Title 24 base case design.

### Small Single Family House

- ☐ 2,025 square feet
- ☐ 2-story
- ☐ 20.2% glazing/floor area ratio

#### **Incremental Cost Estimate to Exceed Title 24 by 15%**

**Single Family Prototype: 2,025 SF, Option 1 - No AC**

2025 sf

Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Roof w/ Radiant Barrier (from R-38 w/Radiant Barrier): 1,443 sf @ 0.30 to 0.45/sf	Downgrade	\$ (649)	\$ (433)	\$ (541)
R-19 Walls (from R-13): 2,550 sf @\$0.31 to \$0.54/sf	Upgrade	\$ 791	\$ 1,377	\$ 1,084
R-19 Raised Floor over Garage/Open at 2nd Floor	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: None	-	\$ -	\$ -	\$ -
R-4.2 Attic Ducts (from R-6)	Downgrade	\$ (325)	\$ (225)	\$ (275)
Reduced Duct Leakage/Testing (HERS)	Upgrade	\$ 300	\$ 600	\$ 450
50 Gallon Gas Water Heater: EF=0.62	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 116</b>	<b>\$ 1,319</b>	<b>\$ 718</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.06</b>	<b>\$ 0.65</b>	<b>\$ 0.35</b>

#### **Incremental Cost Estimate to Exceed Title 24 by 15%**

**Single Family Prototype: 2,025 SF, Option 2 - No AC**

2025 sf

Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier (from R-38 w/Radiant Barrier): 1,443 sf @ 0.15 to 0.20/sf	Downgrade	\$ (289)	\$ (216)	\$ (253)
R-13 Walls	-	\$ -	\$ -	\$ -
R-19 Raised Floor over Garage/Open at 2nd Floor	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 92% AFUE (from 80% AFUE)	Upgrade	\$ 500	\$ 1,200	\$ 850
Air Conditioner: None	-	\$ -	\$ -	\$ -
R-8 Attic Ducts (from R-6)	Upgrade	\$ 225	\$ 325	\$ 275
Reduced Duct Leakage/Testing (HERS)	Upgrade	\$ 300	\$ 600	\$ 450
50 Gallon Gas Water Heater: EF=0.63 (from EF=0.62)	Upgrade	\$ -	\$ 50	\$ 25
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 736</b>	<b>\$ 1,959</b>	<b>\$ 1,347</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.36</b>	<b>\$ 0.97</b>	<b>\$ 0.67</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Single Family Prototype: 2,025 SF, Option 3 with AC**

2025 sf

Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Roof w/ Radiant Barrier (from R-30 w/Radiant Barrier): 1,443 sf @ 0.25 to 0.35/sf	Downgrade	\$ (505)	\$ (361)	\$ (433)
R-19 Walls (from R-13): 2,550 sf @\$0.31 to \$0.54/sf	Upgrade	\$ 791	\$ 1,377	\$ 1,084
R-19 Raised Floor over Garage/Open at 2nd Floor	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: 13 SEER, 11 EER (HERS)	-	\$ -	\$ -	\$ -
Air Conditioner: Refrig. Charge (HERS)	-	\$ -	\$ -	\$ -
R-4.2 Attic Ducts (from R-6)	Downgrade	\$ (325)	\$ (225)	\$ (275)
Reduced Duct Leakage/Testing (HERS)	Upgrade	\$ 300	\$ 600	\$ 450
50 Gallon Gas Water Heater: EF=0.60 (from EF=0.62)	Downgrade	\$ (200)	\$ (100)	\$ (150)
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 60</b>	<b>\$ 1,291</b>	<b>\$ 676</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.03</b>	<b>\$ 0.64</b>	<b>\$ 0.33</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Single Family Prototype: 2,025 SF, Option 4 with AC**

2025 sf

Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-21 Walls (from R-13): 2,550 sf @ \$0.45 to \$0.70/sf	Upgrade	\$ 1,148	\$ 1,785	\$ 1,466
R-19 Raised Floor over Garage/Open at 2nd Floor	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: 13 SEER, 11 EER (HERS)	-	\$ -	\$ -	\$ -
Air Conditioner: Refrig. Charge (HERS)	-	\$ -	\$ -	\$ -
R-6 Attic Ducts	-	\$ -	\$ -	\$ -
50 Gallon Gas Water Heater: EF=0.63 (from EF=0.62)	Upgrade	\$ -	\$ 50	\$ 25
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 1,148</b>	<b>\$ 1,835</b>	<b>\$ 1,491</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.57</b>	<b>\$ 0.91</b>	<b>\$ 0.74</b>

## **Large Single Family House**

- ☐ 4,500 square feet
- ☐ 2-story
- ☐ 22.0% glazing/floor area ratio

### **Incremental Cost Estimate to Exceed Title 24 by 15%**

**Single Family Prototype: 4,500 SF, Option 1 - No AC**

**4500 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-21 Walls (from R-13): 2,518 sf @ \$0.45 to \$0.70/sf	Upgrade	\$ 1,133	\$ 1,763	\$ 1,448
R-30 Raised Floor (from R-19): 2,700 sf @ \$0.25 to \$0.35	Upgrade	\$ 675	\$ 945	\$ 810
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(2) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: None	-	\$ -	\$ -	\$ -
R-8 Attic Ducts (from R-6)	Upgrade	\$ 450	\$ 650	\$ 550
Reduced Duct Leakage/Testing (HERS)	-	\$ -	\$ -	\$ -
(2) 50 Gallon Gas Water Heaters: EF=0.63 (from EF=0.60)	Upgrade	\$ 200	\$ 500	\$ 350
Pipe Insulation	Upgrade	\$ 300	\$ 400	\$ 350
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 2,758</b>	<b>\$ 4,258</b>	<b>\$ 3,508</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.61</b>	<b>\$ 0.95</b>	<b>\$ 0.78</b>

### **Incremental Cost Estimate to Exceed Title 24 by 15%**

**Single Family Prototype: 4,500 SF, Option 2 - No AC**

**4500 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-19 Walls (from R-13): 2,518 sf @ \$0.31 to \$0.54/sf	Upgrade	\$ 781	\$ 1,360	\$ 1,070
R-19 Raised Floor	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(2) Furnaces: 92% AFUE (from 80% AFUE)	Upgrade	\$ 1,000	\$ 2,400	\$ 1,700
Air Conditioner: None	-	\$ -	\$ -	\$ -
R-6 Attic Ducts	-	\$ -	\$ -	\$ -
Reduced Duct Leakage/Testing (HERS)	-	\$ -	\$ -	\$ -
(2) 50 Gallon Gas Water Heaters: EF=0.63 (from EF=0.60)	Upgrade	\$ 200	\$ 500	\$ 350
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 1,981</b>	<b>\$ 4,260</b>	<b>\$ 3,120</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.44</b>	<b>\$ 0.95</b>	<b>\$ 0.69</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Single Family Prototype: 4,500 SF, Option 3 with AC**

**4500 sf**

**Climate Zone 2**

<b>Energy Efficiency Measures</b>	<b>Change</b>	<b>Incremental Cost Estimate</b>		
R-38 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-19 Walls (from R-13): 2,518 sf @ \$0.31 to \$0.54/sf	Upgrade	\$ 781	\$ 1,360	\$ 1,070
R-19 Raised Floor	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(2) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
(2) Air Conditioners: 13 SEER, 11 EER (HERS)	Upgrade	\$ 50	\$ 150	\$ 100
(2) Air Conditioner: Refrig. Charge (HERS)	Upgrade	\$ 300	\$ 400	\$ 350
R-4.2 Attic Ducts (from R-6)	Downgrade	\$ (650)	\$ (450)	\$ (550)
Reduced Duct Leakage/Testing (HERS)	-	\$ -	\$ -	\$ -
(2) Instantaneous Gas Water Heaters: RE=0.80 (from 50 Gal Gas: EF=0.62)	Upgrade	\$ 1,800	\$ 3,000	\$ 2,400
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 2,281</b>	<b>\$ 4,460</b>	<b>\$ 3,370</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.51</b>	<b>\$ 0.99</b>	<b>\$ 0.75</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Single Family Prototype: 4,500 SF, Option 4 with AC**

**4500 sf**

**Climate Zone 2**

<b>Energy Efficiency Measures</b>	<b>Change</b>	<b>Incremental Cost Estimate</b>		
R-38 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-19 Walls (from R-13): 2,518 sf @ \$0.31 to \$0.54/sf	Upgrade	\$ 781	\$ 1,360	\$ 1,070
R-19 Raised Floor	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(2) Furnaces: 92% AFUE (from 80% AFUE)	Upgrade	\$ 1,000	\$ 2,400	\$ 1,700
(2) Air Conditioners: 13 SEER, 11 EER (HERS)	Upgrade	\$ 50	\$ 150	\$ 100
(2) Air Conditioner: Refrig. Charge (HERS)	Upgrade	\$ 300	\$ 400	\$ 350
R-4.2 Attic Ducts (from R-6)	Downgrade	\$ (650)	\$ (450)	\$ (550)
Reduced Duct Leakage/Testing (HERS)	-	\$ -	\$ -	\$ -
(2) 50 Gallon Gas Water Heaters: EF=0.63 (from EF=0.62)	Upgrade	\$ -	\$ 100	\$ 50
Pipe Insulation	Upgrade	\$ 300	\$ 400	\$ 350
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 1,781</b>	<b>\$ 4,360</b>	<b>\$ 3,070</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.40</b>	<b>\$ 0.97</b>	<b>\$ 0.68</b>



### **Low-rise Multi-family Apartments**

- ☐ 8,442 square feet
- ☐ 8 units/2-story
- ☐ 12.5% glazing/floor area ratio

#### **Incremental Cost Estimate to Exceed Title 24 by 15%**

**Multi-Family Prototype: 8,442 SF, Option 1 - No AC**

**8442 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-21 Walls (from R-13 ): 10,146 sf @ \$0.45 to \$0.70/sf	Upgrade	\$ 4,566	\$ 7,102	\$ 5,834
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(8) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: None	-	\$ -	\$ -	\$ -
R-6 Attic Ducts	-	\$ -	\$ -	\$ -
(8) 40 Gallon Gas Water Heaters: EF=0.63	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 4,566</b>	<b>\$ 7,102</b>	<b>\$ 5,834</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.54</b>	<b>\$ 0.84</b>	<b>\$ 0.69</b>

#### **Incremental Cost Estimate to Exceed Title 24 by 15%**

**Multi-Family Prototype: 8,442 SF, Option 2 - No AC**

**8442 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Roof w/ Radiant Barrier (from R-30 w/Radiant Barrier): 4,221 sf @ 0.25 to 0.35/sf	Upgrade	\$ (1,477)	\$ (1,055)	\$ (1,266)
R-19 Walls (from R-13 ): 10,146 sf @ \$0.31 to \$0.54/sf	Upgrade	\$ 3,145	\$ 5,479	\$ 4,312
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(8) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: None	-	\$ -	\$ -	\$ -
R-4.2 Attic Ducts (from R-6)	Downgrade	\$ (1,600)	\$ (1,000)	\$ (1,300)
Reduced Duct Leakage/Testing (HERS)	Upgrade	\$ 2,400	\$ 4,800	\$ 3,600
(8) 40 Gallon Gas Water Heaters: EF=0.60 (from EF=0.63)	Downgrade	\$ (2,000)	\$ (800)	\$ (1,400)
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 468</b>	<b>\$ 7,424</b>	<b>\$ 3,946</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.06</b>	<b>\$ 0.88</b>	<b>\$ 0.47</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Multi-Family Prototype: 8,442 SF, Option 3 with AC**

**8442 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Roof w/ Radiant Barrier (from R-38 w/Radiant Barrier): 4,221 sf @ 0.30 to 0.45/sf	Downgrade	\$ (1,899)	\$ (1,266)	\$ (1,583)
R-21 Walls (from R-13 ): 10,146 sf @ \$0.45 to \$0.70/sf	Upgrade	\$ 4,566	\$ 7,102	\$ 5,834
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(8) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
(8) Air Conditioners: 13 SEER, 11 EER (HERS)	Upgrade	\$ 200	\$ 600	\$ 400
(8) Air Conditioner: Refrig. Charge (HERS)	Upgrade	\$ 1,200	\$ 1,600	\$ 1,400
R-8 Attic Ducts	-	\$ -	\$ -	\$ -
(8) 40 Gallon Gas Water Heaters: EF=0.63	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 4,066</b>	<b>\$ 8,036</b>	<b>\$ 6,051</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.48</b>	<b>\$ 0.95</b>	<b>\$ 0.72</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Multi-Family Prototype: 8,442 SF, Option 4 with AC**

**8442 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier	-	\$ -	\$ -	\$ -
R-19 Walls (from R-13 ): 10,146 sf @ \$0.31 to \$0.54/sf	Upgrade	\$ 3,145	\$ 5,479	\$ 4,312
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(8) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
(8) Air Conditioners: 13 SEER, 11 EER (HERS)	Upgrade	\$ 200	\$ 600	\$ 400
(8) Air Conditioner: Refrig. Charge (HERS)	Upgrade	\$ 1,200	\$ 1,600	\$ 1,400
R-8 Attic Ducts	-	\$ -	\$ -	\$ -
(8) 40 Gallon Gas Water Heaters: EF=0.63	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 4,545</b>	<b>\$ 7,679</b>	<b>\$ 6,112</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.54</b>	<b>\$ 0.91</b>	<b>\$ 0.72</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Multi-Family Prototype: 8,442 SF, Option 5 with AC**

**8442 sf**

**Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Roof w/ Radiant Barrier (from R-38 w/Radiant Barrier): 4,221 sf @ 0.30 to 0.45/sf	Downgrade	\$ (1,899)	\$ (1,266)	\$ (1,583)
R-19 Walls (from R-13 ): 10,146 sf @ \$0.31 to \$0.54/sf	Upgrade	\$ 3,145	\$ 5,479	\$ 4,312
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
(8) Furnaces: 80% AFUE	-	\$ -	\$ -	\$ -
(8) Air Conditioners: 13 SEER	-	\$ -	\$ -	\$ -
(8) Air Conditioner: Refrig. Charge (HERS)	Upgrade	\$ 1,200	\$ 1,600	\$ 1,400
R-4.2 Attic Ducts (from R-8)	Downgrade	\$ (3,000)	\$ (2,000)	\$ (2,500)
Reduced Duct Leakage/Testing (HERS)	Upgrade	\$ 2,400	\$ 4,800	\$ 3,600
(8) 40 Gallon Gas Water Heaters: EF=0.60 (from EF=0.63)	Downgrade	\$ (2,000)	\$ (800)	\$ (1,400)
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ (154)</b>	<b>\$ 7,813</b>	<b>\$ 3,829</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ (0.02)</b>	<b>\$ 0.93</b>	<b>\$ 0.45</b>

**High-rise Multifamily Apartments**

- ☐ 36,800 sf,
- ☐ 40 units/4-story
- ☐ Window to Wall Ratio = 31.6%

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**High-rise Residential Prototype: 36,800 SF, Option 1**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Metal Roof w/ <b>R-15 (3") rigid insulation</b> ; cool roof Reflectance = 0.55 Emittance = 0.75; 9,200 sf @ \$0.75 - \$1.00/sf	Upgrade	\$ 15,600	\$ 24,960	\$ 20,280
R-19 in Metal Frame Walls	-	-	-	-
<b>R-6</b> (K-13 spray-on) Raised Slab over parking garage; 9,200 sf @ \$0.50 - \$0.75/sf	Upgrade	\$ 4,600	\$ 6,900	\$ 5,750
Dual Metal Windows: COG U-factor=0.3, <b>COG SHGC=0.27</b> 6,240 sf @ \$1.50 to \$2.50/sf	Upgrade	\$ 9,360	\$ 15,600	\$ 12,480
2 ton 4-pipe fan coil, <b>98% AFUE boiler</b> , 70-ton scroll air cooled chiller 0.72 KW/ton	Upgrade	\$ 2,500	\$ 4,000	\$ 3,250
Central DHW boiler: <b>98% AFUE</b> and recirculating system w/ timer-temperature controls with <b>premium</b> variable speed pump	Upgrade	\$ 2,500	\$ 4,000	\$ 3,250
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 34,560</b>	<b>\$ 55,460</b>	<b>\$ 45,010</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.94</b>	<b>\$ 1.51</b>	<b>\$ 1.22</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**High-rise Residential Prototype: 36,800 SF, Option 2**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Metal Roof w/ R-10 (2") rigid insulation; cool roof <b>Reflectance = 0.81 Emittance = 0.89</b> ; 9,200 sf @ \$0.45 - \$0.55/sf	Upgrade	\$ 4,140	\$ 5,060	\$ 4,600
R-19 in Metal Frame Walls	-	-	-	-
<b>R-6</b> (K-13 spray-on) Raised Slab over parking garage; 9,200 sf @ \$0.50 - \$0.75/sf	Upgrade	\$ 4,600	\$ 6,900	\$ 5,750
Dual Metal Windows: COG U-factor=0.3, <b>COG SHGC=0.27</b> 6,240 sf @ \$1.50 to \$2.50/sf	Upgrade	\$ 9,360	\$ 15,600	\$ 12,480
2 ton 4-pipe fan coil, <b>98% AFUE boiler</b> , 70-ton scroll air cooled chiller 0.72 KW/ton	Upgrade	\$ 2,500	\$ 4,000	\$ 3,250
Central DHW boiler: <b>98% AFUE</b> and recirculating system w/ timer- temperature controls with <b>premium</b> variable speed pump	Upgrade	\$ 2,500	\$ 4,000	\$ 3,250
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 23,100</b>	<b>\$ 35,560</b>	<b>\$ 29,330</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.63</b>	<b>\$ 0.97</b>	<b>\$ 0.80</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**High-rise Residential Prototype: 36,800 SF, Option 3**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 Metal Roof w/ R-10 (2") rigid insulation; cool roof Reflectance = 0.55 Emittance = 0.75	-			
R-19 in Metal Frame Walls	-			
R-4 (1.25" K-13 spray-on) Raised Slab over parking garage	-			
Dual Metal Windows: COG U-factor=0.3, <b>COG SHGC=0.27</b> 6,240 sf @ \$1.50 to \$2.50/sf	Upgrade	\$ 9,360	\$ 15,600	\$ 12,480
2 ton 4-pipe fan coil, 84% AFUE boiler, 70-ton scroll air cooled chiller 0.72 KW/ton	-			
Central DHW boiler: 84% AFUE and recirculating system w/ timer- temperature controls <b>with 20% solar for hot water and space heating</b> @ \$900 - \$1,500 per dwelling unit	Upgrade	\$ 36,000	\$ 60,000	\$ 48,000
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 45,360</b>	<b>\$ 75,600</b>	<b>\$ 60,480</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 1.23</b>	<b>\$ 2.05</b>	<b>\$ 1.64</b>

## Low-rise Office Building

- ☐ Single Story
- ☐ 10,580 sf,
- ☐ Window to Wall Ratio = 37.1%

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Nonresidential Prototype: 10,580 SF, Option 1**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 under Metal Deck with 3" rigid (R-15) above; <b>with Cool Roof Reflectance = 0.81, Emittance = 0.89;</b> 10,580 sf @ \$0.45 - \$0.55/sf	Upgrade	\$ 4,761	\$ 5,819	\$ 5,290
R-19 in Metal Frame Walls	-	\$ -	\$ -	\$ -
R-0 (un-insulated) slab-on-grade 1st floor	-	\$ -	\$ -	\$ -
Metal windows: COG U=0.30, <b>COG SHGC=0.38;</b> 3,200 sf @ \$1.00 to \$2.00/sf	Upgrade	\$ 3,200	\$ 6,400	\$ 4,800
Lighting = 0.783 w/sf. Open Office Areas: (60) 2-lamp T8 fixtures @58w each; no lighting controls; (24) 18w recessed CFLs. Small Offices: (56) 2-lamp T8 fixtures, <b>(28) multi-level occupancy sensors @ \$75 to \$100 each;</b> (40) 18w recessed CFLs. Support Areas: (32) 18w recessed CFLs; (48) 13w CFL wall sconces; no controls.	Upgrade	\$ 2,100	\$ 2,800	\$ 2,450
(3) 10-ton DX units EER=11.1; 82% AFUE furnaces; standard efficiency fan motors; fixed temp. integrated air economizers, <b>DDC with DCV at spaces, cycle on at night</b>	Upgrade	\$ 2,250	\$ 4,500	\$ 3,375
R-6 duct insulation w/ducts on roof, HERS verified duct leakage	-	\$ -	\$ -	\$ -
(1) Tank Gas Water Heaters EF=0.58	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 12,311</b>	<b>\$ 19,519</b>	<b>\$ 15,915</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 1.16</b>	<b>\$ 1.84</b>	<b>\$ 1.50</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Nonresidential Prototype: 10,580 SF, Option 2**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 under Metal Deck with 3" rigid (R-15) above; <b>with Cool Roof Reflectance = 0.81, Emittance = 0.89;</b> 10,580 sf @ \$0.45 - \$0.55/sf	Upgrade	\$ 4,761	\$ 5,819	\$ 5,290
R-19 in Metal Frame Walls	-	\$ -	\$ -	\$ -
R-0 (un-insulated) slab-on-grade 1st floor	-	\$ -	\$ -	\$ -
Metal windows: COG U=0.30, <b>COG SHGC=0.27;</b> 3,200 sf @ \$1.50 to \$3.00/sf	Upgrade	\$ 4,800	\$ 9,600	\$ 7,200
Lighting = 0.678 w/sf: Open Office Areas: <b>(32) 2-lamp T8 fixtures @74w each;</b> no lighting controls; (24) 18w recessed CFLs. Small Offices: (56) 2-lamp T8 fixtures, <b>(28) multi-level occupancy sensors on T8s @ \$75 to \$100 each;</b> (40) 18w recessed CFLs Support Areas: (32) 18w recessed CFLs; (48) 13w CFL wall sconces; no controls.	Upgrade	\$ 820	\$ 1,648	\$ 1,234
(3) 10-ton DX units EER=11.1; 82% AFUE furnaces; standard efficiency fan motors; fixed temp. integrated air economizers, <b>cycle on at night</b>	Upgrade	\$ 450	\$ 750	\$ 600
R-6 duct insulation w/ducts on roof, HERS verified duct leakage	-	\$ -	\$ -	\$ -
(1) Tank Gas Water Heaters EF=0.58	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 10,831</b>	<b>\$ 17,817</b>	<b>\$ 14,324</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 1.02</b>	<b>\$ 1.68</b>	<b>\$ 1.35</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Nonresidential Prototype: 10,580 SF, Option 3**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 under Metal Deck with 3" rigid (R-15) above; <b>with Cool Roof Reflectance = 0.81, Emittance = 0.89;</b> 10,580 sf @ \$0.45 - \$0.55/sf	Upgrade	\$ 4,761	\$ 5,819	\$ 5,290
R-19 in Metal Frame Walls	-	\$ -	\$ -	\$ -
R-0 (un-insulated) slab-on-grade 1st floor	-	\$ -	\$ -	\$ -
Metal windows: COG U=0.30, <b>COG SHGC=0.31;</b> 3,200 sf @ \$1.5 to \$2.50/sf	Upgrade	\$ 4,800	\$ 8,000	\$ 6,400
Lighting = 0.678 w/sf: Open Office Areas: <b>(32) 2-lamp T8 fixtures @74w each;</b> no lighting controls; (24) 18w recessed CFLs. Small Offices: (56) 2-lamp T8 fixtures, <b>(28) multi-level occupancy sensors on T8s @ \$75 to \$100 each;</b> (40) 18w recessed CFLs Support Areas: (32) 18w recessed CFLs; (48) 13w CFL wall sconces: no controls	Upgrade	\$ 820	\$ 1,648	\$ 1,234
(3) 10-ton DX units EER=11.1; 82% AFUE furnaces; standard efficiency fan motors; fixed temp. integrated air economizers, <b>cycle on at night</b>	Upgrade	\$ 450	\$ 750	\$ 600
<b>R-8 duct</b> insulation w/ducts on roof, HERS verified duct leakage	Upgrade	\$ 450	\$ 900	\$ 675
(1) Tank Gas Water Heaters <b>EF=0.65</b>	Upgrade	\$ 250	\$ 500	\$ 375
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 11,531</b>	<b>\$ 17,617</b>	<b>\$ 14,574</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 1.09</b>	<b>\$ 1.67</b>	<b>\$ 1.38</b>

## High-rise Office Building

- ☐ 5-story
- ☐ 52,900 sf,
- ☐ Window to Wall Ratio = 34.5%

### Incremental Cost Estimate to Exceed Title 24 by 15% Nonresidential Prototype: 52,900 SF, Option 1

Climate Zone 2

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 under Metal Deck with <b>3" rigid insulation above (R-15)</b> , Cool Roof Reflectance = 0.55, Emittance = 0.75; 10580 sf @ \$0.75 - \$1.00/sf	Upgrade	\$ 7,935	\$ 10,580	\$ 9,258
R-19 in Metal Frame Walls	-	\$ -	\$ -	\$ -
R-0 (un-insulated) slab-on-grade 1st floor	-	\$ -	\$ -	\$ -
Metal windows: <b>COG U=0.30, COG SHGC=0.38</b> ; 16,000 sf @ \$1.50 to \$3.00/sf	Upgrade	\$ 24,000	\$ 48,000	\$ 36,000
Lighting = 0.858 w/sf: Open Office Areas: (300) 2-lamp T8 fixtures @58w each; no lighting controls; (120) 18w recessed CFLs no lighting controls. Small Offices: (280) 2-lamp T8 58w fixtures on/off lighting controls; (200) 18w recessed CFLs no lighting on/off lighting controls. Support Areas: (160) 18w recessed CFLs no lighting controls; (240) 13w CFL wall sconces; no lighting controls.	-	\$ -	\$ -	\$ -
(3) 70 ton Packaged VAV system 10.3 EER/80% TE, standard efficiency variable speed fan motors; 20% VAV boxes, hot water reheat on perimeter zones with 82% AFUE boiler, fixed temp. economizer	-	\$ -	\$ -	\$ -
R-6 duct insulation w/ ducts in conditioned	-	\$ -	\$ -	\$ -
(1) Boiler (combined with space heat) 82% AFUE	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 31,935</b>	<b>\$ 58,580</b>	<b>\$ 45,258</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.60</b>	<b>\$ 1.11</b>	<b>\$ 0.86</b>



**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Nonresidential Prototype: 52,900 SF, Option 1**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 under Metal Deck with <b>3" rigid insulation above (R-15)</b> , Cool Roof Reflectance = 0.55, Emittance = 0.75; 10580 sf @ \$0.75 - \$1.00/sf	Upgrade	\$ 7,935	\$ 10,580	\$ 9,258
R-19 in Metal Frame Walls	-	\$ -	\$ -	\$ -
R-0 (un-insulated) slab-on-grade 1st floor	-	\$ -	\$ -	\$ -
Metal windows: <b>COG U=0.30, COG SHGC=0.38</b> ; 16,000 sf @ \$1.50 to \$3.00/sf	Upgrade	\$ 24,000	\$ 48,000	\$ 36,000
Lighting = 0.858 w/sf: Open Office Areas: (300) 2-lamp T8 fixtures @58w each; no lighting controls; (120) 18w recessed CFLs no lighting controls. Small Offices: (280) 2-lamp T8 58w fixtures on/off lighting controls; (200) 18w recessed CFLs no lighting on/off lighting controls. Support Areas: (160) 18w recessed CFLs no lighting controls; (240) 13w CFL wall sconces; no lighting controls.	-	\$ -	\$ -	\$ -
(3) 70 ton Packaged VAV system 10.3 EER/80% TE, standard efficiency variable speed fan motors; 20% VAV boxes, hot water reheat on perimeter zones with 82% AFUE boiler, fixed temp. economizer	-	\$ -	\$ -	\$ -
R-6 duct insulation w/ ducts in conditioned	-	\$ -	\$ -	\$ -
(1) Boiler (combined with space heat) 82% AFUE	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 31,935</b>	<b>\$ 58,580</b>	<b>\$ 45,258</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.60</b>	<b>\$ 1.11</b>	<b>\$ 0.86</b>

**Incremental Cost Estimate to Exceed Title 24 by 15%**  
**Nonresidential Prototype: 52,900 SF, Option 2**

**Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-19 under Metal Deck with <b>3" rigid insulation above (R-15)</b> , Cool Roof Reflectance = 0.55, Emittance = 0.75; 10580 sf @ \$0.75 - \$1.00/sf	Upgrade	\$ 7,935	\$ 10,580	\$ 9,258
R-19 in Metal Frame Walls	-	\$ -	\$ -	\$ -
R-0 (un-insulated) slab-on-grade 1st floor	-	\$ -	\$ -	\$ -
Metal windows: <b>COG U=0.30, COG SHGC=0.54</b> ; 16,000 sf @ \$1.00 to \$2.50/sf	Upgrade	\$ 16,000	\$ 40,000	\$ 28,000
Lighting = 0.785 w/sf: Open Office Areas: (300) 2-lamp T8 fixtures @58w each; no lighting controls; (120) 18w recessed CFLs no lighting controls. Small Offices: (280) 2-lamp T8 58w fixtures w/ <b>140 multi-level occupancy sensors on T8s @ \$75 to \$100 each</b> ; (200) 18w recessed CFLs no lighting on/off lighting controls. Support Areas: (160) 18w recessed CFLs no lighting controls; (240) 13w CFL wall sconces; no lighting controls.	Upgrade	\$ 10,500	\$ 14,000	\$ 12,250
(3) 70 ton Packaged VAV system 10.3 EER/80% TE, standard efficiency variable speed fan motors; <b>20% VAV boxes</b> , hot water reheat on perimeter zones with 82% AFUE boiler, fixed temp. economizer, <b>cycle on at night</b>	Upgrade	\$ 11,600	\$ 16,225	\$ 13,913
R-6 duct insulation w/ ducts in conditioned	-	\$ -	\$ -	\$ -
(1) Boiler (combined with space heat) 82% AFUE	-	\$ -	\$ -	\$ -
<b>Total Incremental Cost of Energy Efficiency Measures:</b>		<b>\$ 46,035</b>	<b>\$ 80,805</b>	<b>\$ 63,420</b>
<b>Total Incremental Cost per Square Foot:</b>		<b>\$ 0.87</b>	<b>\$ 1.53</b>	<b>\$ 1.20</b>

## 5.0 Cost -Effectiveness Determination

Regardless of the building design, occupancy profile and number of stories, the incremental improvement in overall annual energy performance of buildings in exceeding the 2008 Standards is determined to be cost-effective. However, each building's overall design, occupancy type and specific design choices may allow for a large range of incremental costs for exceeding 2008 Standards, estimated annual energy cost savings, and subsequent payback period.

### Small Single Family

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
2,025 sf (Option 1)	321	97	\$718	\$169	4.2
2,025 sf (Option 2)	172	125	\$1,348	\$175	7.7
2,025 sf (Option 3)	334	94	\$676	\$168	4.0
2,025 sf (Option 4)	336	95	\$1,492	\$170	8.8
Averages:	291	103	\$1,058	\$170	6.2

*Annual Reduction in CO2-equivalent: 0.66 lb./sq.ft.-year, 1,327 lb./building-year*  
*Increased Cost / lb. CO2-e reduction: \$0.80*

### Large Single Family

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
4,500 sf (Option 1)	475	142	\$3,508	\$249	14.1
4,500 sf (Option 2)	321	168	\$3,121	\$251	12.4
4,500 sf (Option 3)	439	152	\$3,371	\$254	13.3
4,500 sf (Option 4)	439	137	\$3,071	\$237	13.0
Averages:	419	150	\$3,267	\$248	13.2

*Annual Reduction in CO2-equivalent: 0.43 lb./sq.ft.-year, 1,931 lb./building-year*  
*Increased Cost / lb. CO2-e reduction: \$1.69*

### Low-rise Multi-family Apartments

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
8-Unit, 8,442 sf (Option 1)	1410	339	\$5,834	\$644	9.1
8-Unit, 8,442 sf (Option 2)	1476	310	\$3,946	\$622	6.3
8-Unit, 8,442 sf (Option 3)	1493	285	\$6,051	\$596	10.1
8-Unit, 8,442 sf (Option 4)	1526	287	\$6,112	\$605	10.1
8-Unit, 8,442 sf (Option 5)	1575	276	\$3,830	\$601	6.4
Averages:	1496	299	\$5,155	\$614	8.4

*Annual Reduction in CO2-equivalent: 0.49 lb./sq.ft.-year, 4,158 lb./building-year*  
*Increased Cost / lb. CO2-e reduction: \$1.24*

### High-rise Multi-family Apartments

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
36,800 sf (Option 1)	17462	375	\$45,010	\$3,574	12.6
36,800 sf (Option 2)	18197	206	\$29,330	\$3,512	8.4
36,800 sf (Option 3)	17337	738	\$60,480	\$3,966	15.3
Averages:	17665	440	\$44,940	\$3,684	12.1

*Annual Reduction in CO2-equivalent: 0.36 lb./sq.ft.-year, 13,067 lb./building-year*  
*Increased Cost / lb. CO2-e reduction: \$3.44*

### Low-rise Office Building

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
10,580 sf (Option 1)	11312	-152	\$15,915	\$2,875	5.5
10,580 sf (Option 2)	15304	-570	\$14,324	\$3,393	4.2
10,580 sf (Option 3)	13510	-415	\$14,574	\$3,081	4.7
Averages:	13375	-379	\$14,938	\$3,116	4.8

*Annual Reduction in CO2-equivalent: 0.15 lb./sq.ft.-year, 1,607 lb./building-year*  
*Increased Cost / lb. CO2-e reduction: \$9.29*

### High-rise Office Building

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
52,900 sf (Option 1)	61230	1282	\$45,258	\$19,272	2.3
52,900 sf (Option 2)	16941	1655	\$63,420	\$6,185	10.3
52,900 sf (Option 3)	33841	5280	\$42,196	\$15,602	2.7
Averages:	37337	2739	\$50,291	\$13,686	5.1

*Annual Reduction in CO2-equivalent: 0.92 lb./sq.ft.-year, 36,513 lb./building-year*  
*Increased Cost / lb. CO2-e reduction: \$1.03*

## **Conclusions**

Regardless of the building design, occupancy profile and number of stories, the incremental improvement in overall annual energy performance of buildings which exceed the 2008 Title 24 Building Energy Efficiency Standards by 15% appears cost-effective. However, each building's overall design, occupancy type and specific design choices may allow for a large range of incremental first cost and payback. As with simply meeting the requirements of the Title 24 energy standards, a permit applicant complying with the energy requirements of a green building ordinance should carefully analyze building energy performance to reduce incremental first cost and the payback for the required additional energy efficiency measures.